

TECHNICAL DRAINAGE STUDY

for
Area 1, Phases A & B
Golden Valley Ranch
Mohave County, AZ

Prepared for:

Rhodes Homes Arizona, LLC.
2215 Hualapai Mountain Rd., Suite H
Kingman, Arizona 86401



Stanley Consultants INC.

A Stanley Group Company
Engineering, Environmental and Construction Services - Worldwide

Technical Drainage Study

For

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Golden Valley Ranch
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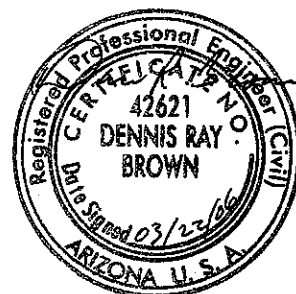
**March 2006
SCI Project # 18449.00.00**

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(See Grading Plans this Project)**

GOLDEN VALLEY RANCH**1. GENERAL LOCATION AND DEVELOPMENT DESCRIPTION****1.1. Introduction**

This study is submitted as the technical drainage study for the proposed improvement plans of Area 1, Phases A & B of the Golden Valley Ranch residential development located in the Sacramento Valley of Mohave County, Arizona, more specifically on the south side of the Golden Valley Community, near Kingman. Area 1 comprises of approximately 187 acres of the total 5,800 acres of land located in the Golden Valley Ranch.

The purpose of this study is to evaluate the storm drainage infrastructure of the proposed development for Area 1, Phase A only. Phase B improvements will be submitted at a later date. Documentation for Phase B is included to provide continuity in the infrastructure improvements.

This study is divided into four separate areas of consideration. They are as follows:

- A general overview of site drainage
- A detailed analysis of the proposed storm drainage infrastructure.
- An analysis of the drainage improvements in the Public Right-of-Way.
- An evaluation of interim facilities serving the site

1.2. Location

The Golden Valley Ranch project site consists of Taxpin Numbers 215-01-048, 215-01-075, 215-01-078, 215-01-079, 215-01-080, 215-01-084, 215-01-085, 215-01-092, & 215-15-005 within Township 20 North, Range 18 West and Township 21 North, and Range 18 West, G&SRM, Mohave County, Arizona (Figure 1 - Vicinity Map and Regional Drainage Scheme).

1.3. FEMA Flood Hazard Zone

Figure 2 is a representation of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Mohave County, AZ, map number 040058 2325C, dated October 20, 2000. Of the 187 acres of Area 1, 25 acres lies in Special Flood Hazard Zone A.

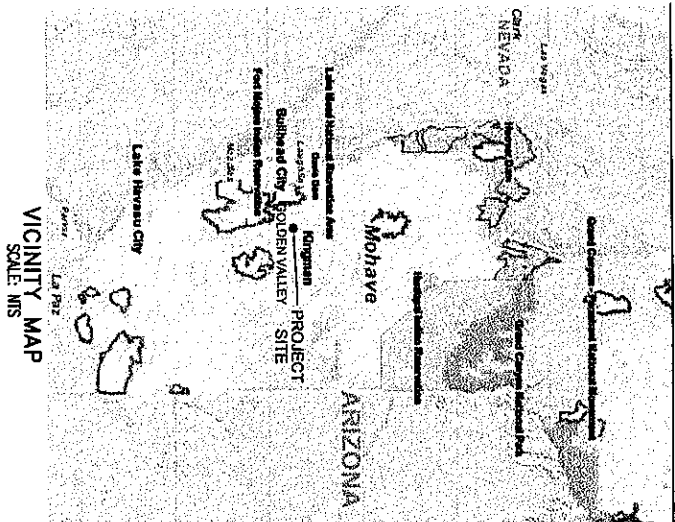
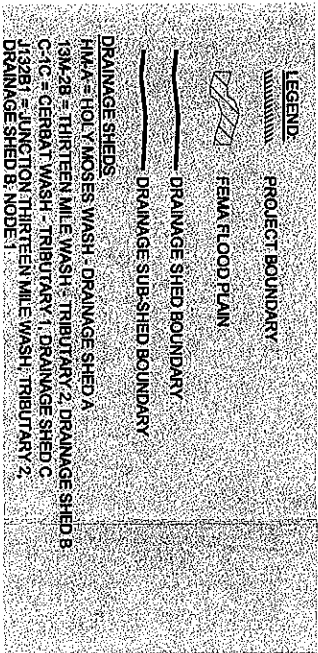
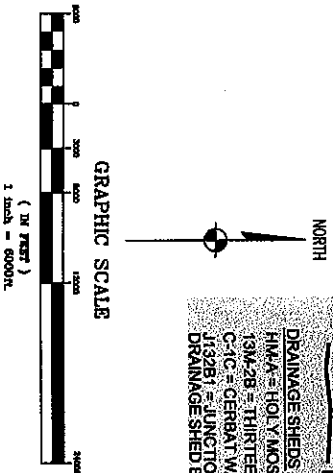
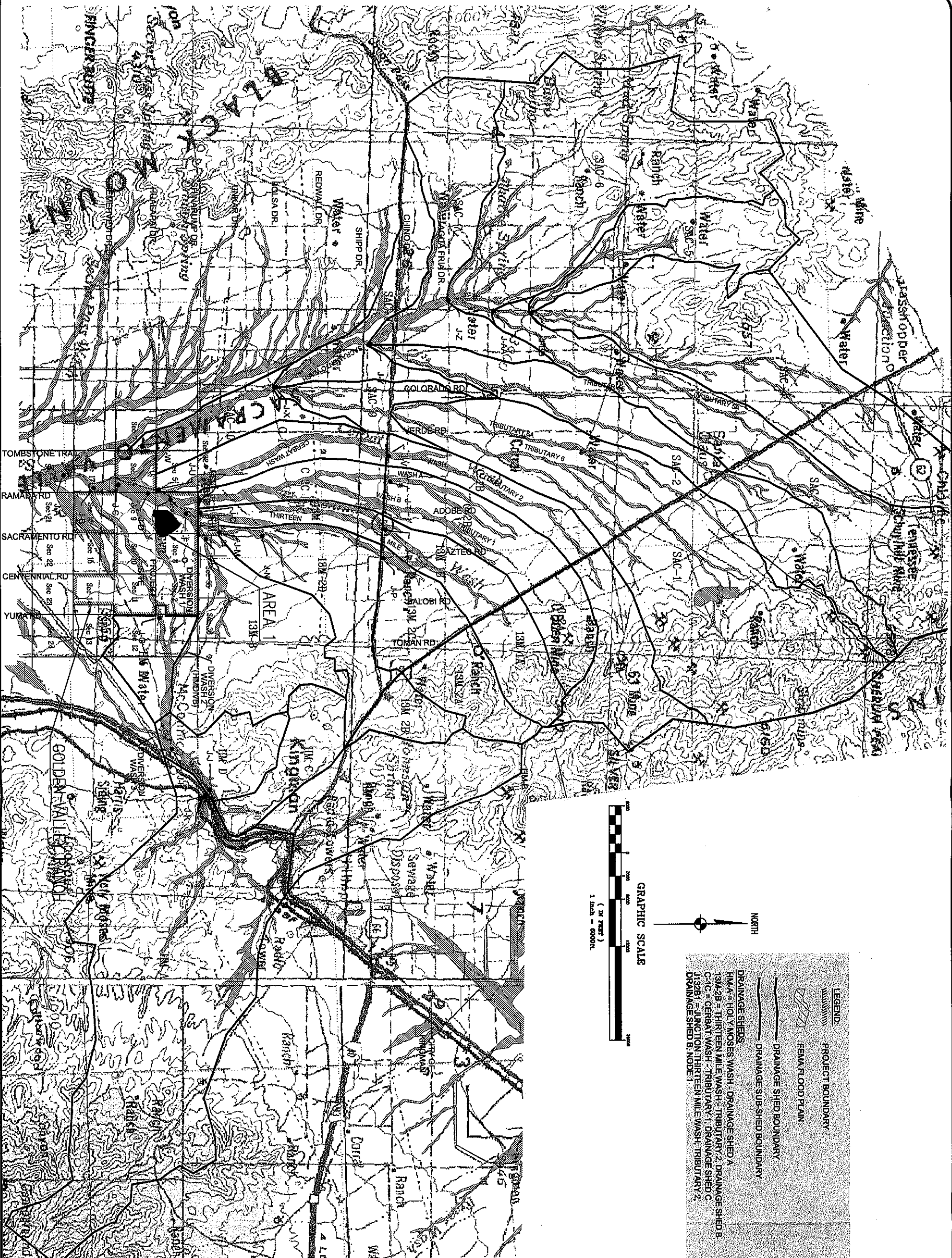
Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations (BFE's) or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.

2. SITE DESCRIPTION**2.1. Description of Property**

The property is semiarid rangeland with a covering of desert shrub in poor condition. Area 1, Phases A & B is located generally in the southwest quadrant of Section 4, Township 20 North, Range 18 West, G&SRM, with minor portions in Sections 3 and 9. The project will be



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GOLDEN VALLEY RANCH - WASH FLOW SUMMARY

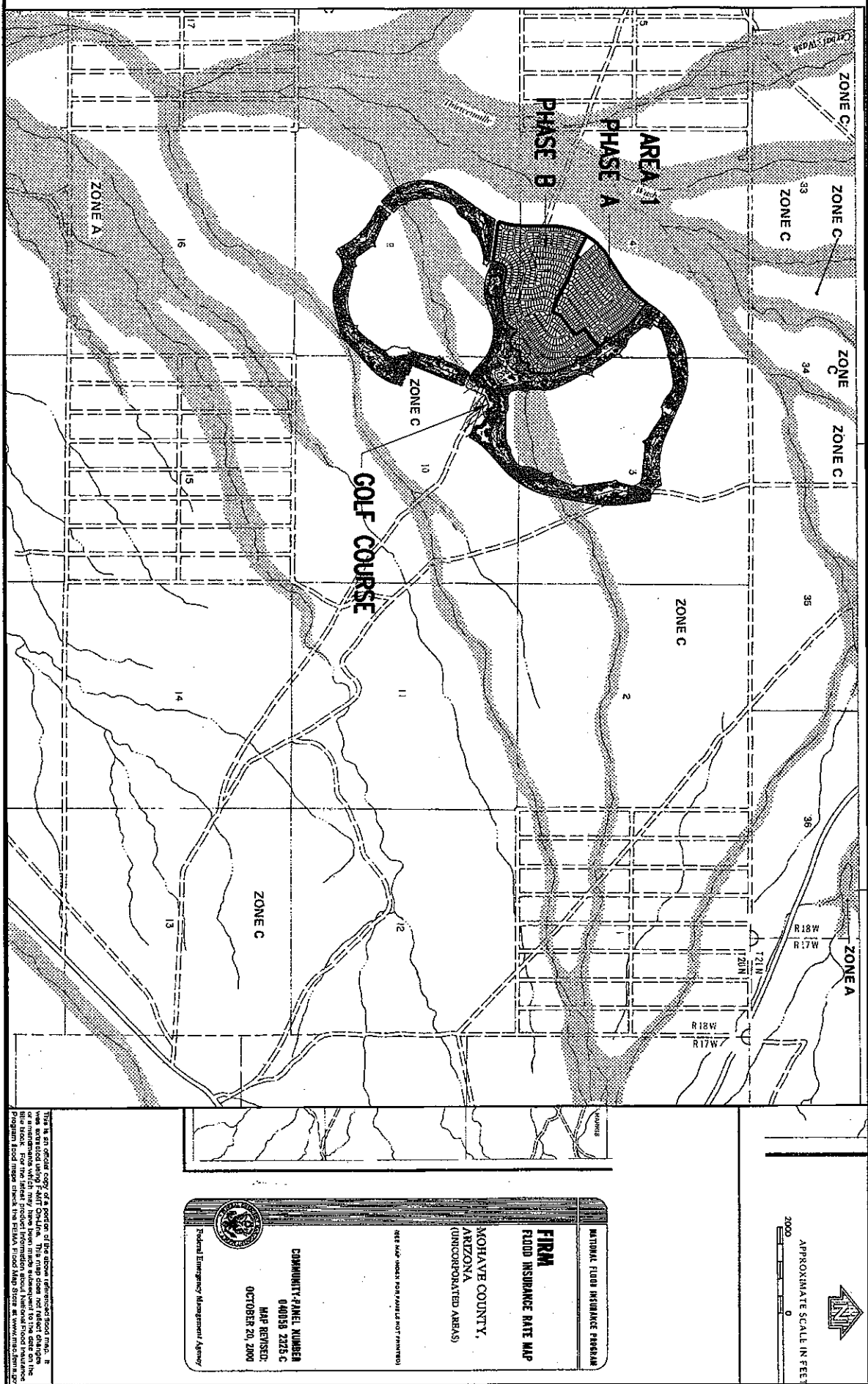
BASIN/NODE	(100yr, 24 hr PRECIPITATION)		BASIN/NODE	(100yr, 24 hr PRECIPITATION)	
	UPSTREAM SITED AREA (Sq. MI.)	FLOW (CFS)		UPSTREAM SITED AREA (Sq. MI.)	FLOW (CFS)
HM-A	36.88	12,887	J-A	289.99	18,556
HM-B	11.68	7,688	J-B	136.79	9,852
HM-C	4.53	3,154	J-C	76.07	9,981
HM-D	4.44	2,042	J-D	67.37	8,281
HM-E	3.40	1,197	J-E	51.13	7,305
HM-F	0.25	242	J-F	38.04	6,457
13M-3	12.08	5,177	J-G	60.72	4,141
13M-4	4.33	3,862	J-H	57.32	14,563
13M-2A	2.41	1,504	J-I	52.88	15,683
13M-2B	3.05	1,304	J-J	48.36	13,344
13M-2C	3.05	1,255	J-K	12.08	5,177
13M-2D	5.99	2,319	J-L	15.78	2,339
13M-1A	3.87	1,255	J-M	9.76	2,746
13M-1B	3.56	1,255	J-N	7.39	2,101
13M-1C	2.50	660	J-P	9.93	1,023
C2-A	3.31	2,184	J-Q	7.43	1,321
C2-B	6.00	1,687	J-R	13.09	1,016
C2-C	3.78	964	J-S	9.31	1,690
C1-A	7.12	3,913	J-T	16.24	1,550
C1-B	4.18	1,048	J-U	11.29	2,452
C1-C	4.94	1,035	J-V	153.19	14,170
SE-D	1.05	653	J-W	149.13	14,670
			J-X	106.13	12,435
			J-Y	80.69	11,890
			J-Z	55.04	9,265
			J-88	33.50	6,188

GOLDEN VALLEY SOUTH VICINITY MAP AND REGIONAL DRAINAGE SCHEME TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY

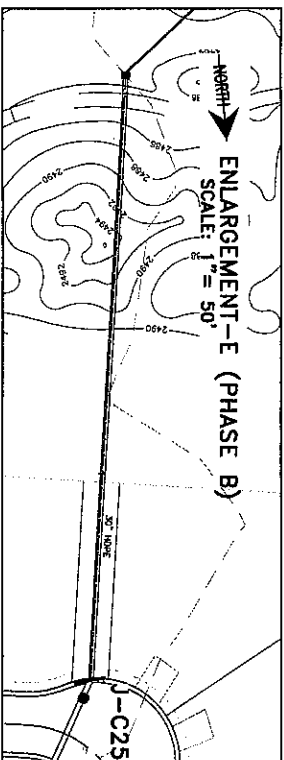
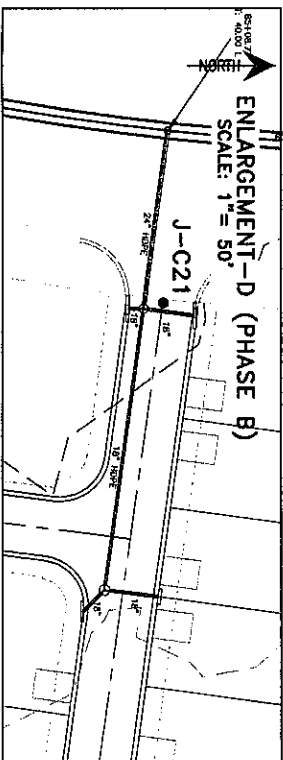
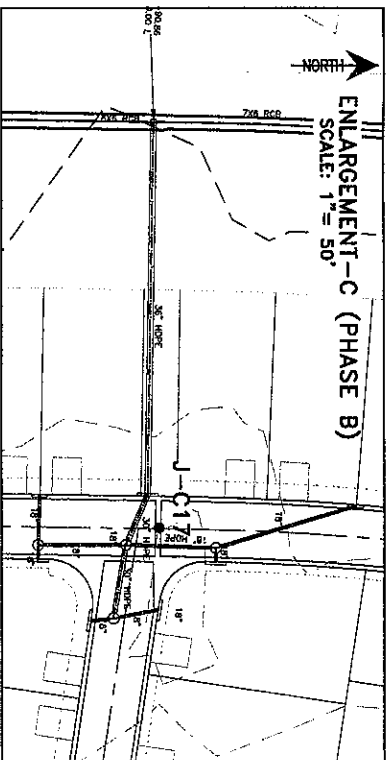
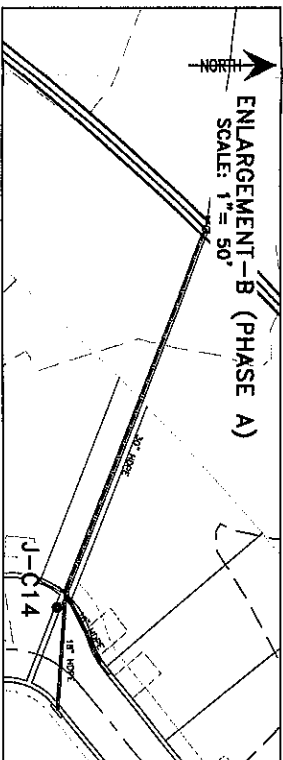
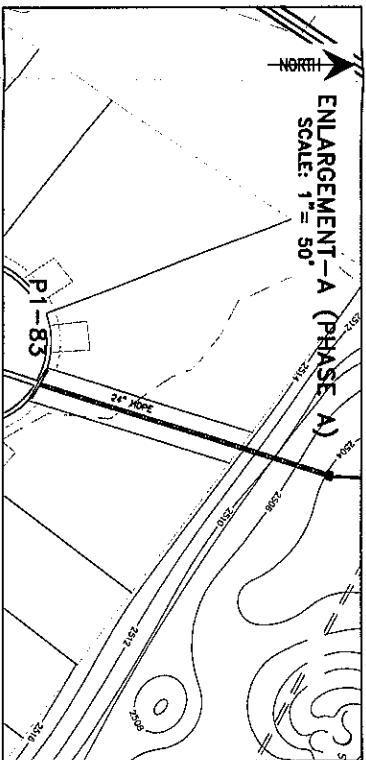
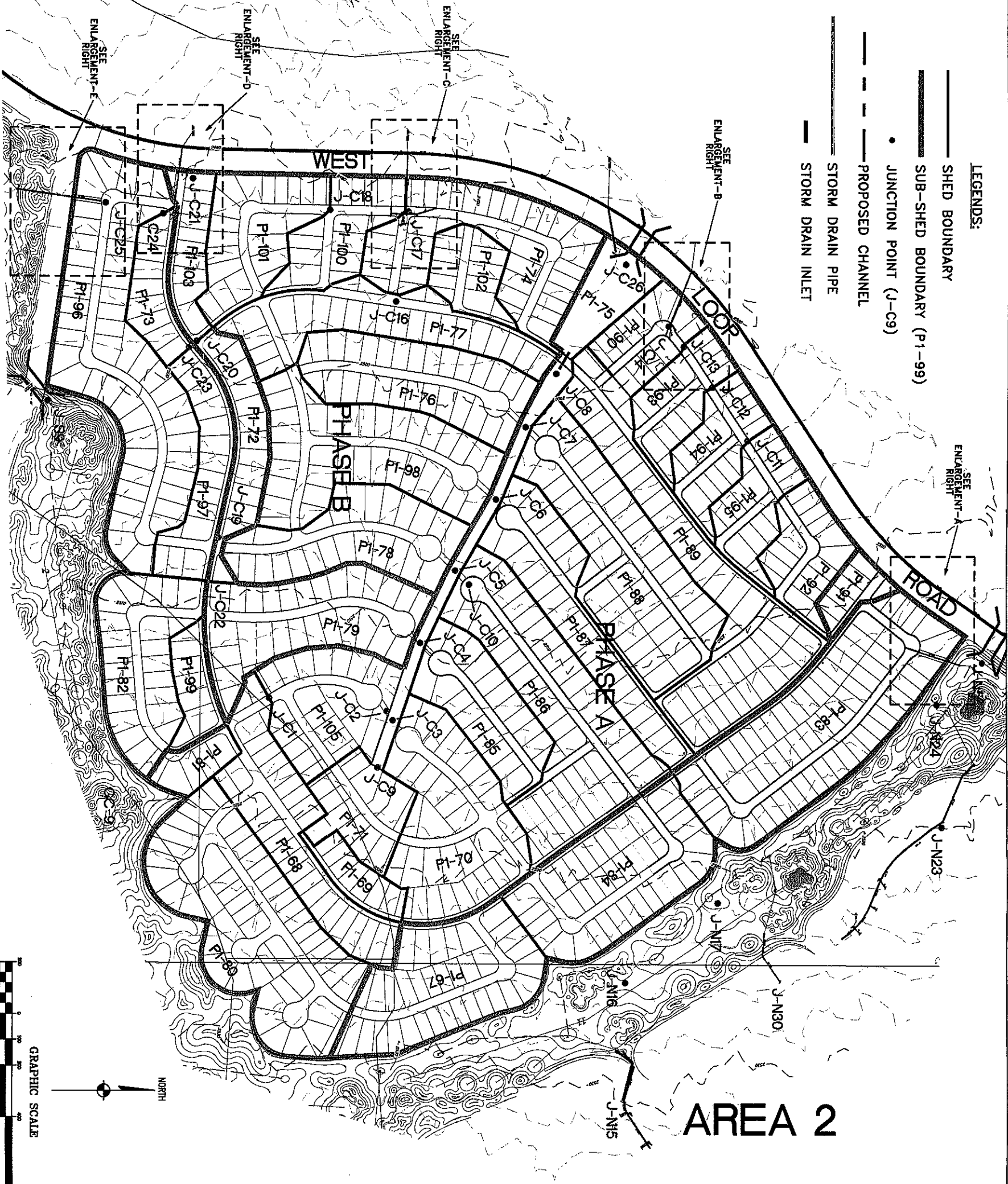
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FIGURE 1





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GOLDEN VALLEY RANCH
AREA 1 DRAINAGE SUB-SHEDS
TECHNICAL DRAINAGE STUDY EXHIBIT

MOHAVE COUNTY

ARIZONA

FIGURE 3

GOLDEN VALLEY RANCH

components. Each component models an aspect of the rainfall-runoff process within a portion of the whole basin. This basin portion is referred to as a sub-basin. The runoff hydrographs of each sub-basin are then combined and a final discharge hydrograph is obtained. It was chosen as the hydrology model since it is the model used in a Preliminary Federal Insurance Study prepared for Mohave County Flood Control District, October 2005 for various watersheds in the Golden Valley and Kingman, AZ area. This adds consistency and reliability in the methodology. Modified-Puls routing in the HEC-HMS model allows for retardation of peak flows within the broad flood way of the golf course.

HEC-RAS, another program from the COE, provides a steady state flow analysis to determine water surface elevations within a defined channel or flood plain. Volume computations within the HEC-RAS program were utilized in developing flow routing by Modified-Puls methods.

Water Surface Pressure Gradient (WSPG) program developed by the Los Angeles County Flood Control District. WSPG is a similar program to HEC-RAS in that it develops the water surface elevations and other channel parameters, but is better adapted to closed (pressure) conduit flow and is therefore used in the evaluation of the stormwater infrastructure system.

Calculations for street capacity are produced using the FlowMaster by Haestad Methods, Inc. Inlet calculations are performed using Federal Highway Administration's Visual Urban program for pavement drainage.

3.2. Drainage Shed and Modeling Convention

The basic naming convention of the basins for the exhibits and model are based around the individual drainage shed of the development. Sheds are labeled as P1-34, identifying Area 1, Shed 34. Junction points or points of runoff confluence are identified as J-C12, identifying that it is a junction point and a label. An R designates a routing of a shed or junction, therefore R-JN15 represents routing of junction JN15 to another point.

3.3. Design Storm and Precipitation

Local jurisdiction requires that water sheds less than 20 square miles be evaluated for the 6-hour local storm. Drainage sheds of 20 to 100 square miles are to be evaluated for both the 6-hour and 24-hour rainfall events. Areas from 20 square miles to 500 square miles are considered general storms and are evaluated for the 24-hour precipitation.

Maricopa County Flood Control District has developed storm distribution curves associated with drainage shed size. Since the total area of Area 1, Phases A & B is less than 1 square mile, Pattern 1 of the Maricopa County 6-Hour Mass Curve was utilized for the storm distribution. Precipitation values of 3.00-inches and 1.76-inches were taken from the National Oceanographic and Atmospheric Administration National Weather Service's Atlas 14. Table 4 provides the precipitation values from NOAA Atlas 14. Since the total area of Area 1 is 0.29 square miles (187 acres) the depth-area reduction factor was not applied.

GOLDEN VALLEY RANCH**Table 1 - Precipitation**

Recurrence Interval (yrs)	5 min	10-min	15-min	30-min	1-hr	2-hr	3-hr	6-hr
10-yr	0.40	0.61	0.75	1.01	1.25	1.44	1.53	1.76
100-yr	0.65	0.98	1.22	1.64	2.03	2.44	2.67	3.00

3.4. Soils

Soils information is taken from the statewide coverage for Arizona, 2005, Natural Resources Conservation Service, Soil Data Mart. Soils within Area 1, Phases A & B consist of CACIQUE-BUCKLEBAR-ALKO (AZ039) type. These soils have a hydrologic soil type designation of "C".

3.5. Model Data and Results

Table 2 summarizes runoff at junction points and drainage sheds within Area 1, Phases A & B. Runoff values are rounded to the nearest 1 cfs.

GOLDEN VALLEY RANCH**Table 2 –Flow Summary**

Element	Area (sq mi)	Peak Discharge 100-yr (cfs)	Peak Discharge 10-yr (cfs)	Element	Area (sq mi)	Peak Discharge 100-yr (cfs)	Peak Discharge 10-yr (cfs)
J-C01	0.0268	57	21	P1-67	0.0107	24	9
J-C02	0.0341	71	25	P1-68	0.0085	19	7
J-C03	0.0523	111	38	P1-69	0.0021	5	2
J-C04	0.0589	126	43	P1-70	0.0117	26	9
J-C05	0.0954	202	70	P1-71	0.0044	10	4
J-C06	0.1036	218	77	P1-72	0.0044	10	4
J-C07	0.1173	240	87	P1-73	0.003	7	3
J-C08	0.1311	266	97	P1-74	0.0105	24	9
J-C09	0.0065	15	6	P1-75	0.0067	7	1
J-C10	0.0365	76	28	P1-76	0.0089	20	7
J-C11	0.0087	20	7	P1-77	0.0087	20	7
J-C12	0.0131	30	11	P1-78	0.0087	20	7
J-C13	0.0172	39	14	P1-79	0.01	22	8
J-C14	0.021	47	17	P1-80	0.0165	37	13
J-C15	0.0213	48	18	P1-81	0.0018	4	2
J-C16	0.03	66	23	P1-82	0.008	18	7
J-C17	0.0548	120	42	P1-83	0.0174	39	14
J-C18	0.0112	25	9	P1-84	0.0115	26	10
J-C19	0.0187	42	15	P1-85	0.0066	15	6
J-C20	0.0231	50	17	P1-86	0.0143	31	11
J-C21	0.0263	54	19	P1-87	0.0082	18	7
J-C22	0.0104	23	9	P1-88	0.0137	30	11
J-C23	0.0154	33	12	P1-89	0.0138	27	10
J-C24	0.0184	37	12	P1-90	0.0038	9	3
J-C25	0.0363	73	23	P1-91	0.0017	4	1
J-C26	0.1378	242	90	P1-92	0.0044	10	4
J-C27	0.0222	49	18	P1-93	0.0041	10	4
				P1-94	0.0044	10	4
				P1-95	0.0043	10	4
				P1-96	0.0179	38	14
				P1-97	0.005	11	4
				P1-98	0.0124	28	10
				P1-99	0.0024	6	2
				P1-100	0.0046	11	4
				P1-101	0.0066	15	6
				P1-102	0.0031	7	3
				P1-103	0.0032	7	3
				P1-105	0.0073	17	6

It should be noted that the precipitation depths of the 100-yr, 6-hr event is 3-inches and that the precipitation depth of the 10-yr, 6-hr storm is 1.53-inches. The 100-yr precipitation is nearly twice for the 10-yr event. For the same events the amount of excess precipitation available for runoff is dependent on the runoff curve number, which is a function of soil type, land use, and antecedent moisture conditions. For this reason a larger portion of the 100-yr precipitation is available for runoff than for the smaller 10-yr storm and the ratio of peak runoff for the 100-yr precipitation to 10-yr precipitations is nearly 3.

GOLDEN VALLEY RANCH

All model results and input data are found in the Appendices of this study. They consist of the following:

- Appendix A – Model Results and Data provides the input parameters and results for Area 1, Phases A & B sheds.
- Appendix B – Drainage Infrastructure provides the storm drain inlet calculations open channel flow calculations through utility easements.
- Appendix C – Street Capacity Calculations
- Appendix D – Public Right-of-Way Drainage Improvements

4. Drainage Improvements within the Public Right-of-Way

Access to the project site is via Shinarump Road from the north to the new Aztec Road alignment and West Loop Road. Aztec Road will receive a culvert crossing at the Power line Easement to convey runoff from off-site areas to the Thirteen Mile Wash. The West Loop Road will have a pipe crossing from the Open Space area of Area 1, Phase 1 and convey this and other Area 1, Phases 1 & 2 runoff south, crossing a future portion of the West Loop Road and discharging into the golf course (See Figure 4). Discharge from Area 1, Phases A & B drainage sheds are discussed in Section 2.2.

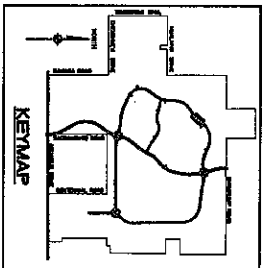
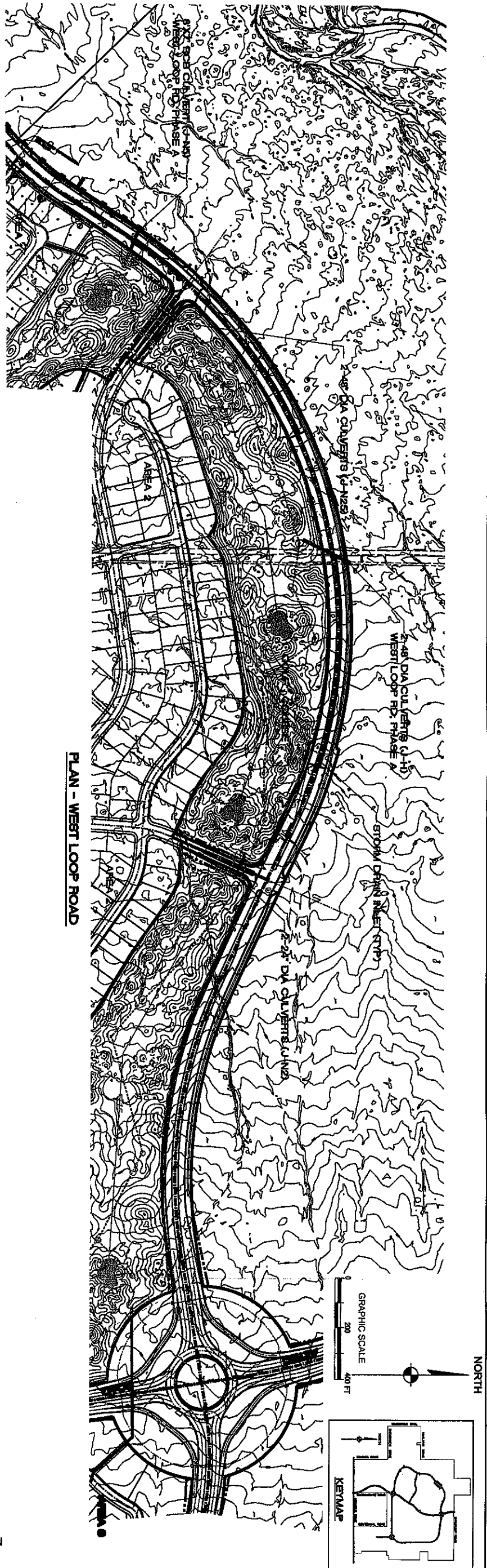
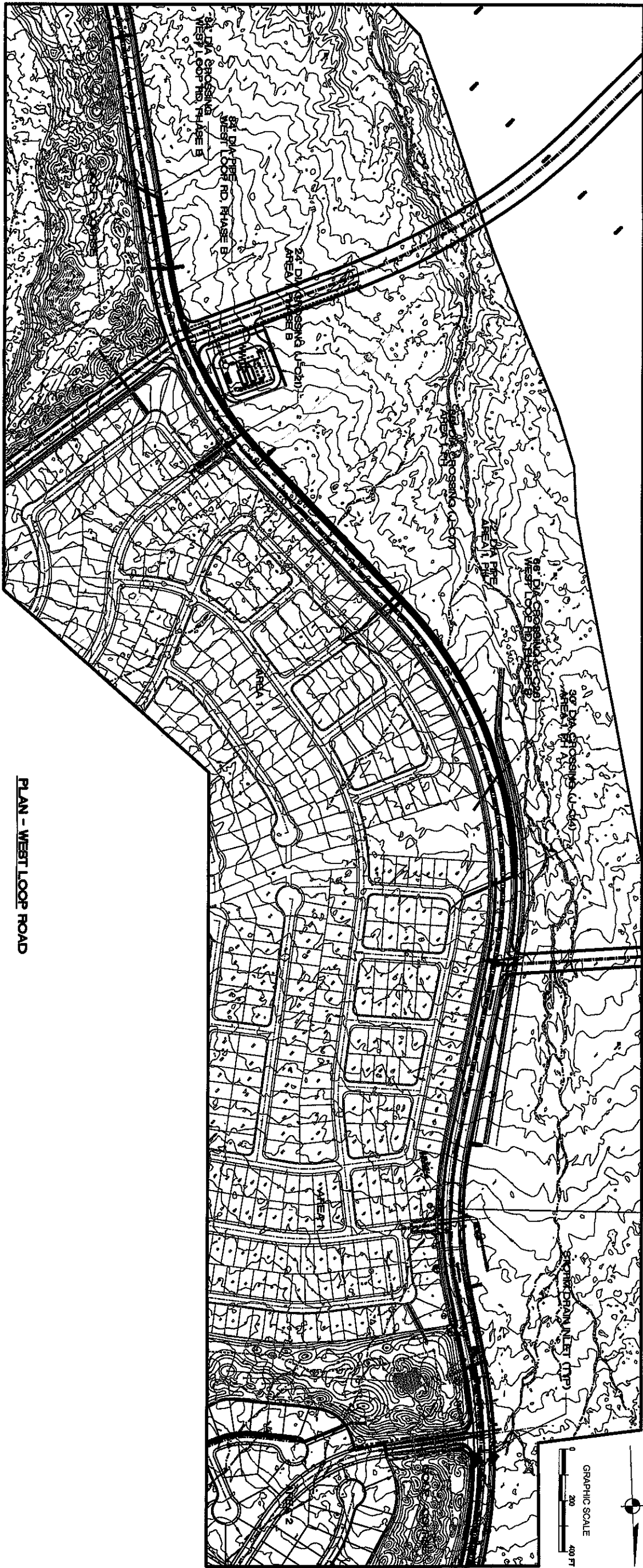
Appendix D contains street capacity calculations for the arterial roads and inlet capacity calculations.

5. Comparison of Flows

The drainage shed characteristics change with development of existing lands. The pervious soils that formerly existed become less pervious with the addition of houses, streets, and sidewalks and the time for runoff to reach its release point shortens. From a drainage point of view, one of the major advantages to the adjacent golf course is that drainage runoff is routed through its fairway system. This not only allows for runoff of the major storm events, but also allows for the golf course to absorb some for the runoff volume, therefore reducing the peak flow. Figure 5 shows existing drainage as it relates to the Area 1-3 development and outside areas that will drain through the proposed system. Table 3 provides a comparison of existing flows to developed flow at major junction points. Note that while runoff from the northern release point J-N5 exceeds its existing flow into the Thirteen Mile Wash, the collective flows from J-N5 and J-S26 is less than existing due to detention provided within the golf course.

Table 3 – Flow Comparison

Shed	Area (acres)	Indirect Methods (cfs)	HEC- HMS (cfs)
J-H	73.26	191	211
J3-44	18.12	73	38
J-S5	69.79	184	187
J-S9	439.35	657	456
J-N5	369.78	582	621
J-S26	713.82	916	798



SHEET
6 OF 40 SHEETS
FIGURE 4
SD PROJECT
10/03/05

RHODES HOMES ARIZONA, LLC
GOLDEN VALLEY RANCH
WEST LOOP ROAD
STORM DRAIN IMPROVEMENTS
MOHAVE COUNTY ARIZONA


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SCALE (H) 1"=200'
SCALE (V)
DRAWN BY VND
CHECKED BY MPB
DATE 8/30/05

DATE	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE



GOLDEN VALLEY RANCH**6. FEMA Base Flood Elevations**

The Holy Moses Diversion Wash #1 leaves the main channel east of the site. It travels in a westerly direction along the westerly sloping alluvial fan. The runoff generally remains within the washes banks, but as it reaches the channel edge it spills over into the surrounding dessert plain. Overtime the cresting and release of flow along with its sediment load has formed a channel with overbanks sloping away from the channel.

A HEC-RAS analysis provides the Base Flood Elevations (BFE) for this diversion wash. The base flood flow within Holy Moses Diversion Wash # 1 is based on derived flow from the Technical Drainage Study for Golden Valley Ranch, Mohave, Arizona, dated October 2005. Finish building grades are developed to remain 1 foot to 1.5 feet above the BFE. Figure 6 shows the BFE's for development in Areas 1-3.

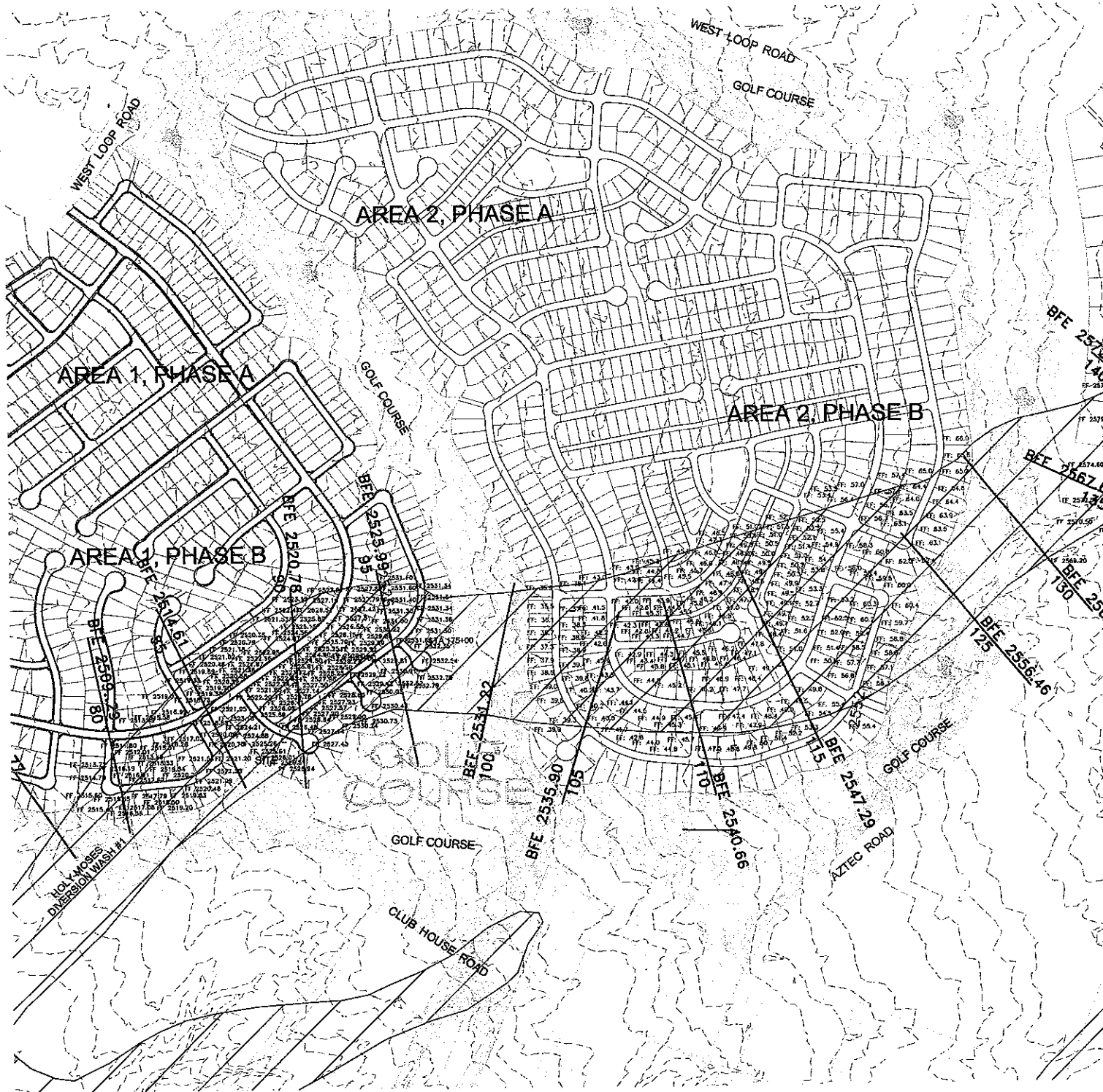
7. SUMMARY

This study develops specific criteria and flow for the development of Area 1, Phases A & B.

- The majority of the development runoff can be maintained and conveyed within the street right-of-way. Where street flow capacity is reached, a storm drainage system is required.
- The drainage infrastructure is capable of conveying the 10-yr, 6-hr storm event (minimum).
- The adjacent golf course services as runoff conveyance and storage.
- Total discharge from the collective Areas 1-3 to the Thirteen Mile Wash is less because of the use of runoff volume storage provided in the golf course.
- Conveyance of stormwater runoff within the golf course fairways allows for some ground water recharge.

8. REFERENCES

- 1) *Flood Insurance Rate Map*, Community Panel Number 040058 2325 C, Mohave County, Arizona, effective October 20, 2002.
- 2) *Highway Drainage Design Manual*, Arizona Department of Transportation, Report Number FHWA-AZ93-281, Final Report, March, 1993
- 3) *Drainage Design Manual for Maricopa County, Arizona*, Hydrology: Rainfall, Flood Control District of Maricopa County, November 2003



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ST-RH036320

GOLDEN VALLEY RANCH

APPENDIX A

AREA 1 – RESULTS AND DATA

- **HEC-HMS 100-YR, 6-HR SIMULATION**
- **HEC-HMS 10-YR, 6-HR SIMULATION**
- **NOAA ATLAS 14 PRECIPITATION**
- **STANDARD FORM 4**

Project: Pod1_S_curve Simulation Run: Pod1-100yr

Start of Run: 01Jan3000, 01:00 Basin Model: POD 1
 End of Run: 02Jan3000, 01:55 Meteorologic Model: S-Pattern 1(3.00IN)
 Execution Time: 15Mar2006, 11:16:57 Control Specifications: Control 1

Volume Units: AC-FT

J-C1	0.0268	56.80	01Jan3000, 05:10	2.70
J-C10	0.0365	76.41	01Jan3000, 05:10	3.67
J-C11	0.0087	19.96	01Jan3000, 05:10	0.88
J-C12	0.0131	29.74	01Jan3000, 05:10	1.32
J-C13	0.0172	38.87	01Jan3000, 05:10	1.74
J-C14	0.0210	47.29	01Jan3000, 05:10	2.13
J-C15	0.0213	47.74	01Jan3000, 05:10	2.15
J-C16	0.0300	65.79	01Jan3000, 05:10	3.02
J-C17	0.0548	120.12	01Jan3000, 05:10	5.53
J-C18	0.0112	25.05	01Jan3000, 05:10	1.13
J-C19	0.0187	41.77	01Jan3000, 05:10	1.89
J-C2	0.0341	71.23	01Jan3000, 05:10	3.44
J-C20	0.0231	49.86	01Jan3000, 05:10	2.33
J-C21	0.0263	54.45	01Jan3000, 05:10	2.65
J-C22	0.0104	23.48	01Jan3000, 05:10	1.05
J-C23	0.0154	33.04	01Jan3000, 05:10	1.56
J-C24	0.0184	37.18	01Jan3000, 05:15	1.86
J-C25	0.0363	73.15	01Jan3000, 05:10	3.67
J-C26	0.1378	241.70	01Jan3000, 05:20	13.54
J-C27	0.0222	49.42	01Jan3000, 05:10	2.24
J-C3	0.0523	111.40	01Jan3000, 05:10	5.28
J-C4	0.0589	125.94	01Jan3000, 05:10	5.95
J-C5	0.0954	202.09	01Jan3000, 05:10	9.62
J-C6	0.1036	217.95	01Jan3000, 05:10	10.45
J-C7	0.1173	240.25	01Jan3000, 05:10	11.83

J-C8	0.1311	266.40	01Jan3000, 05:15	13.22
J-C9	0.0065	14.88	01Jan3000, 05:10	0.66
P1-100	0.0046	10.53	01Jan3000, 05:10	0.46
P1-101	0.0066	14.88	01Jan3000, 05:10	0.67
P1-102	0.0031	7.30	01Jan3000, 05:05	0.31
P1-103	0.0032	7.49	01Jan3000, 05:05	0.32
P1-105	0.0073	16.51	01Jan3000, 05:10	0.74
P1-67	0.0107	24.16	01Jan3000, 05:10	1.08
P1-68	0.0085	18.57	01Jan3000, 05:10	0.86
P1-69	0.0021	4.86	01Jan3000, 05:05	0.21
P1-70	0.0117	25.64	01Jan3000, 05:10	1.18
P1-71	0.0044	10.43	01Jan3000, 05:05	0.44
P1-72	0.0044	9.97	01Jan3000, 05:10	0.44
P1-73	0.0030	6.87	01Jan3000, 05:10	0.30
P1-74	0.0105	23.50	01Jan3000, 05:10	1.06
P1-75	0.0067	6.54	01Jan3000, 05:15	0.32
P1-76	0.0089	20.03	01Jan3000, 05:10	0.90
P1-77	0.0087	19.90	01Jan3000, 05:10	0.88
P1-78	0.0087	19.58	01Jan3000, 05:10	0.88
P1-79	0.0100	22.46	01Jan3000, 05:10	1.01
P1-80	0.0165	36.62	01Jan3000, 05:10	1.66
P1-81	0.0018	4.31	01Jan3000, 05:05	0.18
P1-82	0.0080	18.00	01Jan3000, 05:10	0.81
P1-83	0.0174	38.50	01Jan3000, 05:10	1.75
P1-84	0.0115	26.06	01Jan3000, 05:10	1.16
P1-85	0.0066	15.05	01Jan3000, 05:10	0.67
P1-86	0.0143	30.58	01Jan3000, 05:10	1.44
P1-87	0.0082	17.92	01Jan3000, 05:10	0.83
P1-88	0.0137	30.41	01Jan3000, 05:10	1.38
P1-89	0.0138	26.96	01Jan3000, 05:10	1.39
P1-90	0.0038	9.11	01Jan3000, 05:05	0.38
P1-91	0.0017	4.12	01Jan3000, 05:05	0.17

P1-92	0.0044	10.24	01Jan3000, 05:05	0.44
P1-93	0.0041	9.60	01Jan3000, 05:05	0.41
P1-94	0.0044	9.85	01Jan3000, 05:10	0.44
P1-95	0.0043	10.01	01Jan3000, 05:05	0.43
P1-96	0.0179	38.28	01Jan3000, 05:10	1.80
P1-97	0.0050	11.14	01Jan3000, 05:10	0.50
P1-98	0.0124	27.71	01Jan3000, 05:10	1.25
P1-99	0.0024	5.72	01Jan3000, 05:05	0.24
R-C-11	0.0087	19.89	01Jan3000, 05:10	0.88
R-JC1	0.0268	54.71	01Jan3000, 05:10	2.71
R-JC10	0.0365	76.14	01Jan3000, 05:10	3.68
R-JC12	0.0131	29.49	01Jan3000, 05:10	1.33
R-JC13	0.0172	38.63	01Jan3000, 05:10	1.75
R-JC15	0.0213	45.89	01Jan3000, 05:10	2.15
R-JC16	0.0300	64.39	01Jan3000, 05:10	3.03
R-JC19	0.0187	39.89	01Jan3000, 05:10	1.88
R-JC2	0.0341	70.98	01Jan3000, 05:10	3.44
R-JC20	0.0231	47.13	01Jan3000, 05:10	2.33
R-JC22	0.0104	22.94	01Jan3000, 05:15	1.05
R-JC23	0.0154	32.30	01Jan3000, 05:15	1.56
R-JC24	0.0184	37.14	01Jan3000, 05:15	1.87
R-JC27	0.0222	46.16	01Jan3000, 05:15	2.23
R-JC3	0.0523	110.89	01Jan3000, 05:10	5.28
R-JC4	0.0589	125.94	01Jan3000, 05:10	5.95
R-JC5	0.0954	200.03	01Jan3000, 05:10	9.62
R-JC6	0.1036	212.89	01Jan3000, 05:15	10.45
R-JC7	0.1173	240.28	01Jan3000, 05:15	11.83
R-JC8	0.1311	236.05	01Jan3000, 05:20	13.22
R-JC9	0.0065	14.85	01Jan3000, 05:10	0.66
R-P167	0.0107	23.35	01Jan3000, 05:10	1.08
R-P169	0.0021	4.83	01Jan3000, 05:10	0.21
R-P170	0.0117	25.57	01Jan3000, 05:10	1.18

Project: Pod1_S_curve Simulation Run: Pod1-10yr

Start of Run: 01Jan3000, 01:00 Basin Model: POD 1
 End of Run: 02Jan3000, 01:55 Meteorologic Model: S-Pattern 1(1.53in)
 Execution Time: 15Mar2006, 11:17:04 Control Specifications: Control 1

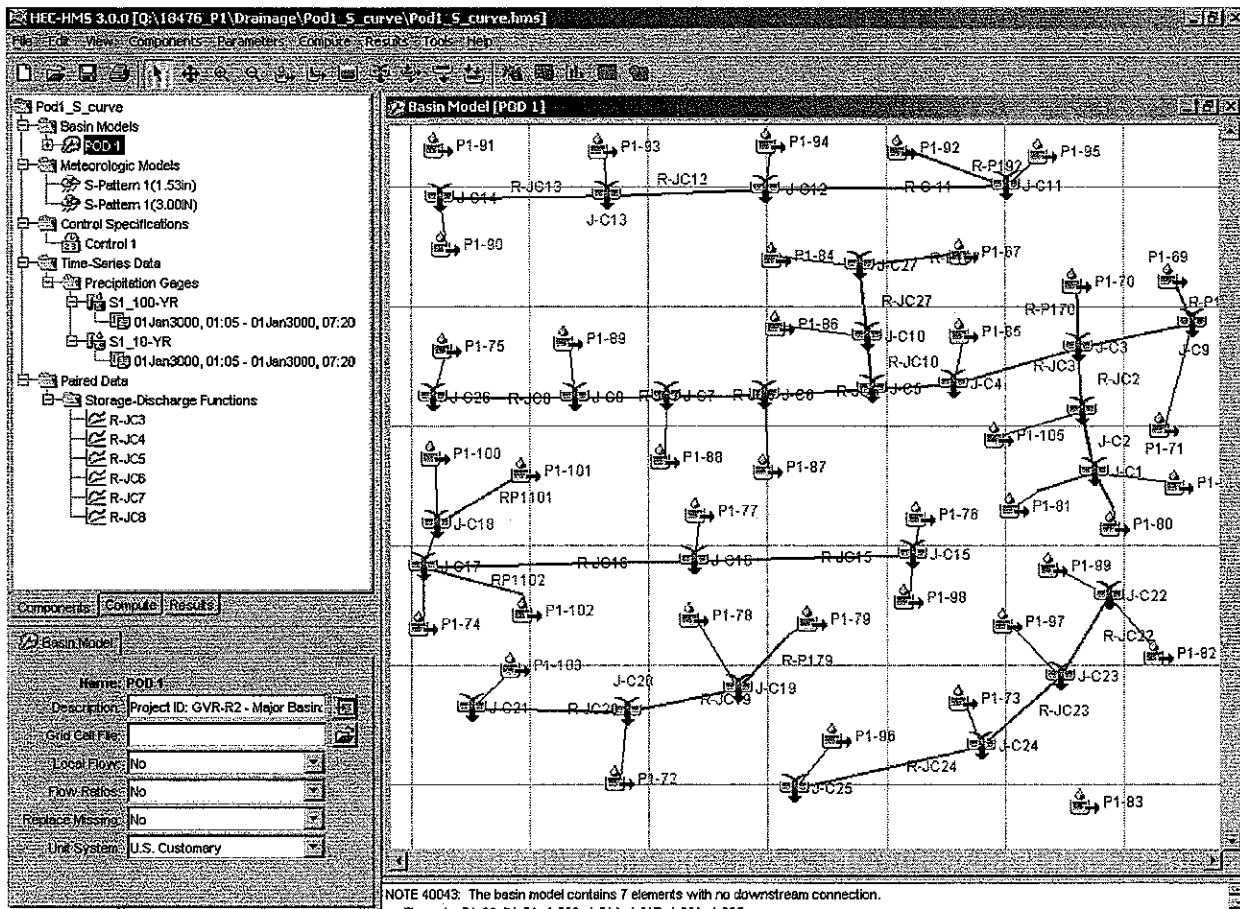
Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
J-C1	0.0268	20.66	01Jan3000, 05:15	0.94
J-C10	0.0365	27.56	01Jan3000, 05:15	1.27
J-C11	0.0087	7.45	01Jan3000, 05:10	0.30
J-C12	0.0131	10.89	01Jan3000, 05:10	0.46
J-C13	0.0172	14.15	01Jan3000, 05:10	0.60
J-C14	0.0210	17.15	01Jan3000, 05:10	0.74
J-C15	0.0213	17.58	01Jan3000, 05:10	0.74
J-C16	0.0300	23.39	01Jan3000, 05:10	1.04
J-C17	0.0548	42.48	01Jan3000, 05:10	1.91
J-C18	0.0112	9.11	01Jan3000, 05:10	0.39
J-C19	0.0187	15.28	01Jan3000, 05:10	0.65
J-C2	0.0341	25.08	01Jan3000, 05:15	1.19
J-C20	0.0231	17.44	01Jan3000, 05:15	0.80
J-C21	0.0263	19.28	01Jan3000, 05:15	0.91
J-C22	0.0104	8.72	01Jan3000, 05:10	0.36
J-C23	0.0154	11.68	01Jan3000, 05:15	0.54
J-C24	0.0184	12.18	01Jan3000, 05:20	0.64
J-C25	0.0363	23.28	01Jan3000, 05:15	1.26
J-C26	0.1378	90.05	01Jan3000, 05:20	4.63
J-C27	0.0222	17.81	01Jan3000, 05:10	0.77
J-C3	0.0523	37.66	01Jan3000, 05:15	1.83
J-C4	0.0589	42.59	01Jan3000, 05:10	2.06
J-C5	0.0954	69.83	01Jan3000, 05:15	3.33
J-C6	0.1036	76.88	01Jan3000, 05:15	3.62
J-C7	0.1173	86.58	01Jan3000, 05:15	4.10

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
J-C8	0.1311	96.50	01Jan3000, 05:15	4.58
J-C9	0.0065	5.55	01Jan3000, 05:10	0.23
P1-100	0.0046	3.95	01Jan3000, 05:10	0.16
P1-101	0.0066	5.50	01Jan3000, 05:10	0.23
P1-102	0.0031	2.68	01Jan3000, 05:10	0.11
P1-103	0.0032	2.76	01Jan3000, 05:10	0.11
P1-105	0.0073	6.12	01Jan3000, 05:10	0.25
P1-67	0.0107	8.95	01Jan3000, 05:10	0.37
P1-68	0.0085	6.76	01Jan3000, 05:10	0.30
P1-69	0.0021	1.81	01Jan3000, 05:10	0.07
P1-70	0.0117	9.35	01Jan3000, 05:10	0.41
P1-71	0.0044	3.80	01Jan3000, 05:10	0.15
P1-72	0.0044	3.70	01Jan3000, 05:10	0.15
P1-73	0.0030	2.58	01Jan3000, 05:10	0.10
P1-74	0.0105	8.65	01Jan3000, 05:10	0.37
P1-75	0.0067	1.04	01Jan3000, 05:15	0.06
P1-76	0.0089	7.40	01Jan3000, 05:10	0.31
P1-77	0.0087	7.46	01Jan3000, 05:10	0.30
P1-78	0.0087	7.23	01Jan3000, 05:10	0.30
P1-79	0.0100	8.29	01Jan3000, 05:10	0.35
P1-80	0.0165	13.42	01Jan3000, 05:10	0.57
P1-81	0.0018	1.55	01Jan3000, 05:10	0.06
P1-82	0.0080	6.65	01Jan3000, 05:10	0.28
P1-83	0.0174	14.09	01Jan3000, 05:10	0.61
P1-84	0.0115	9.67	01Jan3000, 05:10	0.40
P1-85	0.0066	5.61	01Jan3000, 05:10	0.23
P1-86	0.0143	11.05	01Jan3000, 05:10	0.50
P1-87	0.0082	6.52	01Jan3000, 05:10	0.29
P1-88	0.0137	11.15	01Jan3000, 05:10	0.48
P1-89	0.0138	9.61	01Jan3000, 05:15	0.48
P1-90	0.0038	3.28	01Jan3000, 05:10	0.13
P1-91	0.0017	1.48	01Jan3000, 05:05	0.06

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
P1-92	0.0044	3.80	01Jan3000, 05:10	0.15
P1-93	0.0041	3.54	01Jan3000, 05:10	0.14
P1-94	0.0044	3.62	01Jan3000, 05:10	0.15
P1-95	0.0043	3.71	01Jan3000, 05:10	0.15
P1-96	0.0179	13.84	01Jan3000, 05:10	0.62
P1-97	0.0050	4.09	01Jan3000, 05:10	0.17
P1-98	0.0124	10.19	01Jan3000, 05:10	0.43
P1-99	0.0024	2.07	01Jan3000, 05:10	0.08
R-C-11	0.0087	7.27	01Jan3000, 05:10	0.30
R-JC1	0.0268	20.24	01Jan3000, 05:15	0.94
R-JC10	0.0365	27.50	01Jan3000, 05:15	1.27
R-JC12	0.0131	10.61	01Jan3000, 05:10	0.46
R-JC13	0.0172	13.87	01Jan3000, 05:10	0.60
R-JC15	0.0213	16.46	01Jan3000, 05:15	0.74
R-JC16	0.0300	22.28	01Jan3000, 05:15	1.05
R-JC19	0.0187	14.53	01Jan3000, 05:15	0.65
R-JC2	0.0341	25.01	01Jan3000, 05:15	1.19
R-JC20	0.0231	17.35	01Jan3000, 05:15	0.80
R-JC22	0.0104	8.26	01Jan3000, 05:15	0.36
R-JC23	0.0154	10.95	01Jan3000, 05:20	0.54
R-JC24	0.0184	12.12	01Jan3000, 05:20	0.64
R-JC27	0.0222	17.52	01Jan3000, 05:15	0.78
R-JC3	0.0523	38.03	01Jan3000, 05:15	1.83
R-JC4	0.0589	42.56	01Jan3000, 05:10	2.06
R-JC5	0.0954	71.17	01Jan3000, 05:15	3.33
R-JC6	0.1036	77.18	01Jan3000, 05:15	3.62
R-JC7	0.1173	86.89	01Jan3000, 05:15	4.10
R-JC8	0.1311	89.04	01Jan3000, 05:20	4.58
R-JC9	0.0065	5.46	01Jan3000, 05:10	0.23
R-P167	0.0107	8.46	01Jan3000, 05:15	0.37
R-P169	0.0021	1.75	01Jan3000, 05:10	0.07
R-P170	0.0117	9.30	01Jan3000, 05:10	0.41

GOLDEN VALLEY RANCH



Precipitation

Time	100-yr, 6-hr	10-yr, 6-hr
01Jan3000, 01:05	0	0
01Jan3000, 01:20	0.024	0.012
01Jan3000, 01:35	0.048	0.024
01Jan3000, 01:50	0.075	0.038
01Jan3000, 02:05	0.099	0.05
01Jan3000, 02:20	0.123	0.063
01Jan3000, 02:35	0.15	0.077
01Jan3000, 02:50	0.174	0.089
01Jan3000, 03:05	0.198	0.101
01Jan3000, 03:20	0.222	0.113
01Jan3000, 03:35	0.261	0.133
01Jan3000, 03:50	0.297	0.151
01Jan3000, 04:05	0.354	0.181
01Jan3000, 04:20	0.414	0.211
01Jan3000, 04:35	0.648	0.33
01Jan3000, 04:50	1.131	0.577
01Jan3000, 05:05	2.502	1.276
01Jan3000, 05:20	2.733	1.394
01Jan3000, 05:35	2.793	1.424
01Jan3000, 05:50	2.85	1.454
01Jan3000, 06:05	2.886	1.472
01Jan3000, 06:20	2.916	1.487
01Jan3000, 06:35	2.949	1.504
01Jan3000, 06:50	2.973	1.516
01Jan3000, 07:05	3	1.53

StandardForm4

Project:		0		Job No.: 0		Date: 0		Calculated by: 0																
6-Hour Design Storm Distribution		Stanley Consultants INC		Modified STANDARD FORM 4 from the Clark County Regional Flood Control District's Hydrologic Criteria and Drainage Design Manual		Stanley Consultants INC		5820 S. Eastern Ave, Suite 200 Las Vegas, Nevada 89119 702.369.9396																
Drainage Basin Name (Acre) (Sq. Mi.)		Drainage Area		Drainage Area		Drainage Area		Drainage Area																
Cover Type and Hydrologic Condition		Curve Numbers		Sub-Basin Data		Travel Time (Tt)		Tc Check																
Curve Numbers		Curve # for Hydrologic Soil Group		Initial/Overland Time (Ti)		Length (ft)		Slope (%)																
A B C D CN		K (ft/mi)		Area (Acre)		Length (ft)		Slope (%)																
DEVELOPED CONDITIONS		DEVELOPED CONDITIONS		DEVELOPED CONDITIONS		DEVELOPED CONDITIONS		DEVELOPED CONDITIONS																
P1-67		P1-68		P1-69		P1-70		P1-71																
P1-72		P1-73		P1-74		P1-75		P1-76																
P1-77		P1-78		P1-79		P1-80		P1-81																
P1-82		P1-83		P1-84		P1-85		P1-86																
P1-87		P1-88		P1-89		P1-90		P1-91																
P1-92		P1-93		P1-94		P1-95		P1-96																
P1-97		P1-98		P1-99		P1-100																		
7.000 +/-	resubdrain kts	76	84	89	91	89	67	0.78	6.82	130	1.00	6.47	897	0.01	0.17	0.25	75.79	1017	15.7	15.7	9.4	89	0.0107	
7.000 +/-	resubdrain kts	76	84	89	91	89	68	0.78	5.44	170	1.00	7.40	1232	0.01	0.17	0.26	56.54	1402	17.8	17.8	10.7	89	0.0085	
7.000 +/-	resubdrain kts	76	84	89	91	89	69	0.78	1.35	130	1.00	6.47	468	0.01	0.21	0.31	37.74	588	13.3	13.3	8.0	89	0.0021	
7.000 +/-	resubdrain kts	76	84	89	91	89	70	0.78	7.47	130	1.00	6.47	1240	0.01	0.20	0.30	82.56	1370	17.6	17.6	10.6	89	0.0117	
7.000 +/-	resubdrain kts	76	84	89	91	89	71	0.78	2.78	160	1.00	7.48	318	0.01	0.21	0.32	25.01	478	12.7	12.7	7.6	89	0.0044	
7.000 +/-	resubdrain kts	76	84	89	91	89	72	0.78	2.83	140	1.00	6.71	817	0.01	0.17	0.25	71.32	957	15.3	15.3	9.2	89	0.0044	
7.000 +/-	resubdrain kts	76	84	89	91	89	73	0.78	1.95	120	1.00	6.22	569	0.01	0.19	0.29	47.08	689	13.8	13.8	8.3	89	0.0030	
7.000 +/-	resubdrain kts	76	84	89	91	89	74	0.59	6.72	120	1.00	10.12	1038	0.01	0.20	0.30	71.18	1158	16.4	16.4	9.9	89	0.0105	
Open space/parks - good		39	81	74	80	74	75	0.59	4.28	100	1.00	10.00	2240	0.01	0.23	0.34	121.23	2240	22.4	22.4	13.5	74	0.0067	
7.000 +/-	resubdrain kts	76	84	89	91	89	76	0.78	5.71	160	1.00	7.18	925	0.01	0.15	0.22	88.48	1085	16.0	16.0	9.6	89	0.0089	
7.000 +/-	resubdrain kts	76	84	89	91	89	77	0.78	5.65	120	1.00	6.22	602	0.01	0.21	0.32	44.71	722	14.0	14.0	8.4	89	0.0087	
7.000 +/-	resubdrain kts	76	84	89	91	89	78	0.78	5.58	150	1.00	6.56	941	0.01	0.15	0.24	84.61	1031	16.1	16.1	9.6	89	0.0087	
7.000 +/-	resubdrain kts	76	84	89	91	89	79	0.78	6.43	110	1.00	5.95	990	0.01	0.18	0.28	74.20	1100	16.1	16.1	9.7	89	0.0100	
7.000 +/-	resubdrain kts	76	84	89	91	89	80	0.78	10.56	120	1.00	6.22	1144	0.01	0.24	0.36	84.21	1264	17.0	17.0	10.2	89	0.0165	
7.000 +/-	resubdrain kts	76	84	89	91	89	81	0.78	1.18	130	1.00	6.47	286	0.01	0.24	0.36	20.21	416	12.3	12.3	7.4	89	0.0018	
7.000 +/-	resubdrain kts	76	84	89	91	89	82	0.78	5.13	130	1.00	6.47	982	0.01	0.23	0.35	56.81	1082	16.0	16.0	9.6	89	0.0080	
7.000 +/-	resubdrain kts	76	84	89	91	89	83	0.78	11.15	100	1.00	5.67	1166	0.01	0.18	0.27	88.75	1286	17.1	17.1	10.3	89	0.0174	
7.000 +/-	resubdrain kts	76	84	89	91	89	84	0.78	7.39	135	1.00	6.59	821	0.01	0.19	0.28	64.07	956	15.3	15.3	9.2	89	0.0115	
7.000 +/-	resubdrain kts	76	84	89	91	89	85	0.78	4.23	120	1.00	6.22	726	0.01	0.20	0.30	53.79	846	14.7	14.7	8.8	89	0.0066	
7.000 +/-	resubdrain kts	76	84	89	91	89	86	0.78	9.13	130	1.00	6.47	1474	0.01	0.21	0.32	88.86	1604	18.9	18.9	11.3	89	0.0143	
7.000 +/-	resubdrain kts	76	84	89	91	89	87	0.78	5.25	120	1.00	6.22	1294	0.01	0.21	0.32	80.95	1414	17.9	17.9	10.7	89	0.0082	
7.000 +/-	resubdrain kts	76	84	89	91	89	88	0.78	8.76	120	1.00	6.22	1147	0.01	0.18	0.29	81.82	1287	17.0	17.0	10.2	89	0.0137	
7.000 +/-	resubdrain kts	76	84	89	91	89	89	0.78	8.80	130	1.00	6.47	2026	0.01	0.21	0.32	119.30	2156	22.0	22.0	13.2	89	0.0138	
7.000 +/-	resubdrain kts	76	84	89	91	89	90	0.78	2.41	140	1.00	6.71	280	0.01	0.21	0.31	23.53	430	12.4	12.4	7.4	89	0.0038	
7.000 +/-	resubdrain kts	76	84	89	91	89	91	0.78	1.09	120	1.00	6.22	231	0.02	0.27	0.41	14.13	351	12.0	12.0	7.2	89	0.0017	
7.000 +/-	resubdrain kts	76	84	89	91	89	92	0.78	2.81	140	1.00	6.71	436	0.01	0.17	0.26	42.66	576	13.2	13.2	7.9	89	0.0044	
7.000 +/-	resubdrain kts	76	84	89	91	89	93	0.78	2.05	130	1.00	6.47	400	0.01	0.15	0.23	44.50	530	12.9	12.9	7.8	89	0.0041	
7.000 +/-	resubdrain kts	76	84	89	91	89	94	0.78	2.81	120	1.00	6.22	1054	0.01	0.15	0.23	96.29	1174	16.5	16.5	9.9	89	0.0044	
7.000 +/-	resubdrain kts	76	84	89	91	89	95	0.78	2.73	130	1.00	6.47	430	0.01	0.18	0.27	40.80	560	13.1	13.1	7.9	89	0.0043	
7.000 +/-	resubdrain kts	76	84	89	91	89	96	0.78	11.45	140	1.00	6.71	1459	0.01	0.23	0.35	82.80	1589	18.9	18.9	11.3	89	0.0179	
7.000 +/-	resubdrain kts	76	84	89	91	89	97	0.78	3.22	130	1.00	6.47	1103	0.01	0.20	0.31	73.21	1233	16.8	16.8	10.1	89	0.0050	
7.000 +/-	resubdrain kts	76	84	89	91	89	98	0.78	7.96	160	1.00	7.18	1054	0.05	0.46	0.69	31.62	454	16.7	16.7	10.0	89	0.0124	
7.000 +/-	resubdrain kts	76	84	89	91	89	99	0.78	1.53	150	1.00	6.56	304	0.02	0.28	0.43	17.85	454	12.5	12.5	7.5	89	0.0024	
7.000 +/-	resubdrain kts	76	84	89	91	89	100	0.78	2.96	120	1.00	6.22	550	0.01	0.21	0.32	41.76	670	13.7	13.7	8.2	89	0.0046	

18449 - POD 1
HEC-HMS DATA RESULTS
C:\temp\2006160318478\1\StdForm4.xls

ST-RH036330

StandardForm4

SCS Curve Numbers		Curve Numbers		Sub-Basin Data		Initial/Overland Time (T _i)		Travel Time (T _t)		T _c Check (Urbanized Basins)		Final T _c		TLAQ		HEC-INPUT		Remarks								
Drainage Basin Name	Drainage Area (Acres)	Drainage Area (Sq. Mi.)	Curve # for Hydrologic Soils Composite Group					K (Default by CN)	Area (Acres)	Length (feet)	Slope (%)	T _i (Min)	Length (feet)	Slope (%)	V ₁ (FPS) (Manning)	V ₂ (FPS) (Manning)	T _i (Min)	Total Length (Urbanized Basins)	T _c = T _i +T _t (Min)	T _c +0.6 (Min)	Composite CN	Drainage Area (Sq. Mi.)	T _c =10 for Non Urban T _c =5 for Urban			
			A	B	C	D	CN																	(1)	(2)	(3)
P1-101	4.2020	0.0086																								
			Cover Type and Hydrologic Condition																							
P1-102	2.01	0.0031																								
P1-103	2.07	0.0032																								
P1-105	4.67	0.0073																								
		0.2953																								
																		</								

18449 - POD 1
 HEC-HMS DATA RESULTS
 C:\temp\20081603\18476P1StdForm4.xls

ST-RH036331

Shed Parameters - Pod 1

DEVELOPED CONDITIONS					
Drainage Shed	Area (ac)	Elev dn	Elev up	Length (ft)	Slope
P1- 67	6.82056208	2528.9	2522.9	887	0.6764%
P1- 68	5.43982051	2525.4	2516.7	1232	0.7062%
P1- 69	1.33282528	2525.3	2520.4	468	1.0470%
P1- 70	7.47393562	2525.4	2513.3	1240	0.9758%
P1- 71	2.78410071	2520.9	2517.4	318	1.1006%
P1- 72	2.82990899	2503.1	2497.6	817	0.6732%
P1- 73	1.94640098	2497.6	2492.4	569	0.9139%
P1- 74	6.72332983	2498.9	2488.7	1038	0.9827%
P1- 75	4.28184465	2517.4	2489.2	2240	1.2589%
P1- 76	5.70996719	2502.2	2497.3	925	0.5297%
P1- 77	5.54738366	2499.8	2493.2	602	1.0963%
P1- 78	5.57736688	2509.5	2503.9	941	0.5951%
P1- 79	6.42571205	2512.2	2503.9	990	0.8384%
P1- 80	10.5553556	2530.2	2520.8	1144	0.8217%
P1- 81	1.17969603	2518.9	2515	286	1.3636%
P1- 82	5.12524784	2518.9	2506.1	952	1.3445%
P1- 83	11.151259	2519.5	2510.4	1186	0.7673%
P1- 84	7.38699887	2524.7	2517.8	821	0.8404%
P1- 85	4.23359978	2518.1	2510.9	726	0.9917%
P1- 86	9.13315676	2524.1	2507.5	1474	1.1262%
P1- 87	5.24655358	2519.5	2505.4	1294	1.0896%
P1- 88	8.75517188	2512.4	2502.4	1147	0.8718%
P1- 89	8.803328	2518.7	2496.9	2026	1.0760%
P1- 90	2.41032003	2502.3	2499.3	290	1.0345%
P1- 91	1.08501801	2514.2	2510	231	1.8182%
P1- 92	2.80949645	2508.4	2505.3	436	0.7110%
P1- 93	2.64865483	2502.7	2500.5	400	0.5500%
P1- 94	2.81184315	2503.1	2497.3	1054	0.5503%
P1- 95	2.72709787	2506.4	2503.1	430	0.7674%
P1- 96	11.4479667	2508.2	2489.6	1459	1.2748%
P1- 97	3.21621621	2508.9	2497.6	1103	1.0245%
P1- 98	7.95973724	2551.1	2497.3	1054	5.1044%
P1- 99	1.53009463	2513.9	2507.9	304	1.9737%
P1- 100	2.96143496	2494.8	2488.7	550	1.1091%
P1- 101	4.20201393	2498.1	2490.7	919	0.8052%
P1- 102	2.01486774	2495.7	2491.1	356	1.2921%
P1- 103	2.06835346	2495.6	2490.6	412	1.2136%
P1- 105	4.66530826	2519.1	2513	863	0.7068%

Routing

Kinematic Routing

Reach	Length (ft)	slope	Manning "n"	Sub reaches	Shape	Width	Side Slope (xH:V)
R-C-11	250	0.007	0.016	5	Trapezoid	60	0.5
R-JC1	530	0.01	0.016	5	Trapezoid	20	0.5
R-JC10	50	0.01	0.016	5	Trapezoid	20	0.5
R-JC12	170	0.007	0.016	5	Trapezoid	60	0.5
R-JC13	150	0.007	0.016	5	Trapezoid	60	0.5
R-JC15	820	0.007	0.016	5	Trapezoid	60	0.5
R-JC16	330	0.007	0.016	5	Trapezoid	60	0.5
R-JC19	830	0.007	0.016	5	Trapezoid	60	0.5
R-JC2	50	0.01	0.016	5	Trapezoid	20	0.5
R-JC20	680	0.0109	0.016	5	Trapezoid	60	0.5
R-JC22	1000	0.01	0.025	5	Trapezoid	100	0
R-JC23	550	0.008	0.016	5	Trapezoid	60	0.5
R-JC24	390	0.009	0.016	5	Trapezoid	60	0.5
R-JC27	1130	0.007	0.016	5	Trapezoid	60	0.5
R-JC9	200	0.01	0.023	5	Trapezoid	20	0.5
RP1101	400	0.007	0.016	5	Trapezoid	60	0.5
RP1102	380	0.007	0.016	5	Trapezoid	60	0.5
R-P167	650	0.005	0.016	5	Trapezoid	60	0.5
R-P169	330	0.01	0.025	5	Trapezoid	50	0.5
R-P170	50	0.01	0.016	5	Trapezoid	20	0.5
R-P179	200	0.007	0.016	5	Trapezoid	60	0.5
R-P180	1140	0.007	0.016	5	Trapezoid	60	0.5
R-P181	730	0.007	0.016	5	Trapezoid	60	0.5
R-P192	250	0.007	0.016	5	Trapezoid	60	0.5

Modified Puls Routing

Reach	Paired Data Table*
R-JC3	R-JC3
R-JC4	R-JC4
R-JC5	R-JC5
R-JC6	R-JC6
R-JC7	R-JC7
R-JC8	R-JC8

* See OpenSpace_upper-Mod Puls worksheet for data

OpenSpace_upper-Mod Puls

F-JC8		R-J7		R-J6	R-J5	R-J4	R-J3
Flow	sta450-0	Flow	sta250-0	sta600-250	sta900-600	sta1200-900	1350-1200
(cfs)	Storage (ac-ft)	(cfs)	Storage (ac-ft)	Storage (ac-ft)	Storage (ac-ft)	Storage (ac-ft)	Storage (ac-ft)
25	0.0851	25	0.0360	0.0547	0.0509	0.0008	0.0259
50	0.1633	50	0.0603	0.0897	0.0867	0.0014	0.0437
75	0.2662	75	0.0817	0.1219	0.1177	0.0019	0.0592
100	0.4082	100	0.1013	0.1520	0.1422	0.0025	0.0733
125	0.5713	125	0.1199	0.1804	0.1721	0.0030	0.0861
150	0.7372	150	0.1378	0.2073	0.1958	0.0034	0.0978
200	1.1608	175	0.1546	0.2336	0.2182	0.0039	0.1088
250	1.6430	200	0.1712	0.2704	0.2402	0.0043	0.1195
300	2.2029	250	0.2020	0.3228	0.2825	0.0051	0.1392



POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14



Arizona 35.14 N 114.18 W 2703 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 3

G.M. Bonnin, D. Todd, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland, 2003

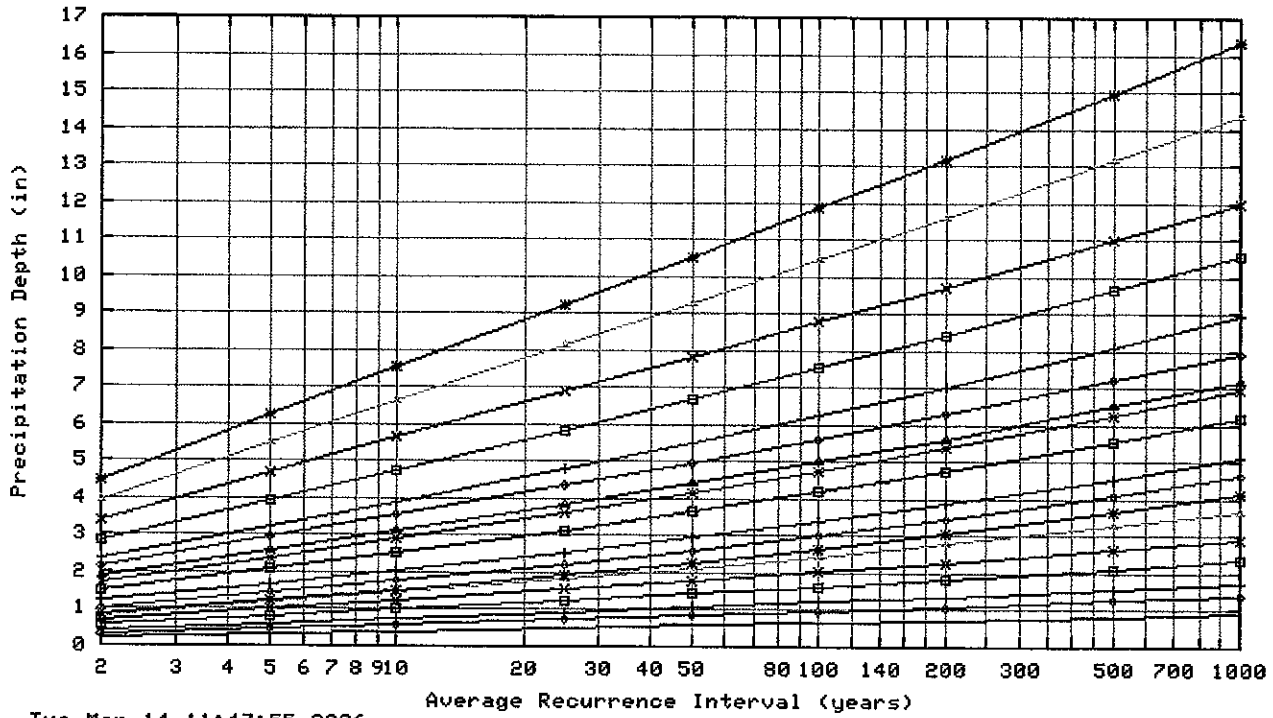
Extracted: Tue Mar 14 2006

Confidence Limits		Seasonality		Location Maps		Other Info		GIS data		Maps		Help		D				
Precipitation Frequency Estimates (inches)																		
ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.23	0.35	0.43	0.58	0.72	0.82	0.89	1.04	1.22	1.51	1.75	1.91	2.18	2.36	2.87	3.40	3.95	4.46
5	0.33	0.50	0.62	0.83	1.03	1.17	1.25	1.44	1.68	2.08	2.40	2.60	2.96	3.23	3.96	4.69	5.51	6.24
10	0.40	0.61	0.75	1.01	1.25	1.44	1.53	1.76	2.05	2.53	2.90	3.13	3.55	3.90	4.77	5.64	6.64	7.53
25	0.49	0.75	0.93	1.26	1.55	1.82	1.95	2.22	2.56	3.15	3.61	3.85	4.36	4.81	5.85	6.89	8.14	9.25
50	0.57	0.86	1.07	1.44	1.78	2.12	2.29	2.59	2.97	3.66	4.17	4.42	4.98	5.53	6.70	7.83	9.29	10.54
100	0.65	0.98	1.22	1.64	2.03	2.44	2.67	3.00	3.42	4.19	4.76	5.01	5.62	6.26	7.56	8.78	10.45	11.86
200	0.73	1.10	1.37	1.84	2.28	2.79	3.07	3.44	3.88	4.75	5.39	5.64	6.29	7.03	8.44	9.73	11.62	13.19
500	0.84	1.27	1.58	2.12	2.63	3.27	3.67	4.08	4.55	5.55	6.26	6.50	7.21	8.12	9.64	10.99	13.18	14.96
1000	0.93	1.41	1.75	2.36	2.92	3.68	4.17	4.62	5.10	6.20	6.97	7.19	7.95	8.98	10.56	11.95	14.37	16.33

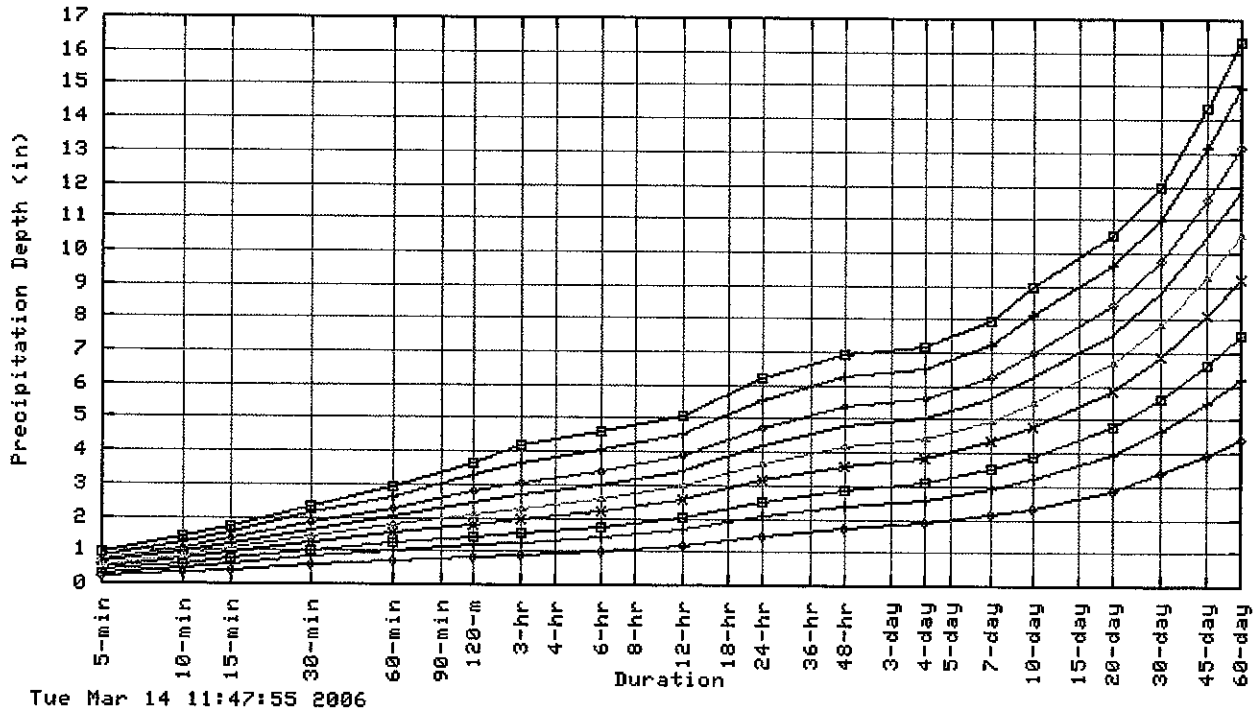
Text version of table

* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval. Please refer to the documentation for more information. NOTE: Formatting forces estimates near zero to appear as zero.

Partial duration based Point Precipitation Frequency Estimates Version: 3
35.14 N 114.18 W 2703 ft



Partial duration based Point Precipitation Frequency Estimates Version: 3
35.14 N 114.18 W 2703 ft



Average Recurrence Interval (years)	
2	+
5	+
10	+
25	+
50	+
100	+
200	+
500	+
1000	+

Confidence Limits -

* Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)																		
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.27	0.42	0.52	0.70	0.86	1.00	1.06	1.23	1.40	1.72	1.97	2.15	2.46	2.65	3.22	3.83	4.49	5.12
5	0.39	0.60	0.74	0.99	1.23	1.42	1.48	1.69	1.93	2.36	2.70	2.92	3.33	3.62	4.43	5.29	6.26	7.16
10	0.48	0.73	0.90	1.21	1.50	1.75	1.83	2.07	2.35	2.86	3.27	3.52	4.00	4.37	5.34	6.35	7.56	8.65
25	0.59	0.90	1.11	1.50	1.85	2.20	2.31	2.60	2.94	3.57	4.07	4.33	4.90	5.40	6.57	7.75	9.28	10.64
50	0.68	1.03	1.28	1.72	2.13	2.58	2.72	3.05	3.43	4.15	4.72	4.98	5.61	6.21	7.53	8.84	10.61	12.13
100	0.77	1.18	1.46	1.96	2.43	2.98	3.18	3.57	3.98	4.79	5.41	5.68	6.36	7.08	8.54	9.96	11.97	13.71
200	0.87	1.33	1.65	2.22	2.75	3.42	3.73	4.13	4.58	5.46	6.15	6.43	7.17	8.01	9.57	11.09	13.36	15.33
500	1.02	1.56	1.93	2.60	3.22	4.09	4.53	4.99	5.52	6.46	7.22	7.49	8.30	9.33	10.99	12.61	15.24	17.51
1000	1.15	1.75	2.17	2.93	3.62	4.67	5.22	5.73	6.32	7.30	8.10	8.35	9.21	10.40	12.13	13.82	16.75	19.23

* The upper bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are greater than.

** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.

Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

* Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)																		
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

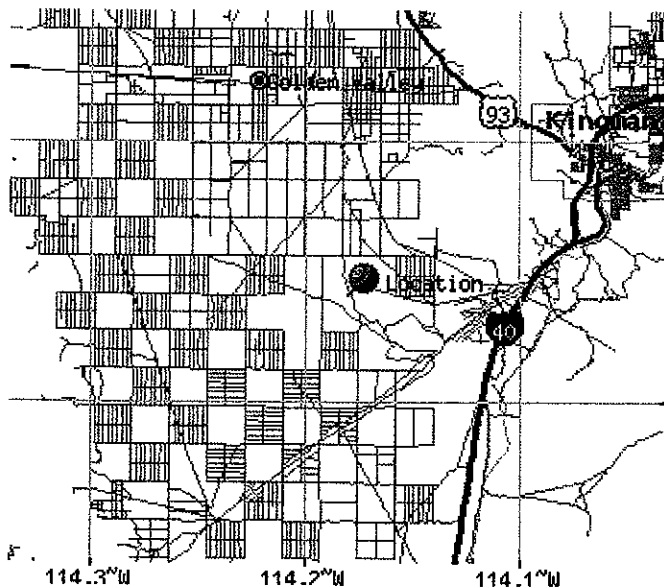
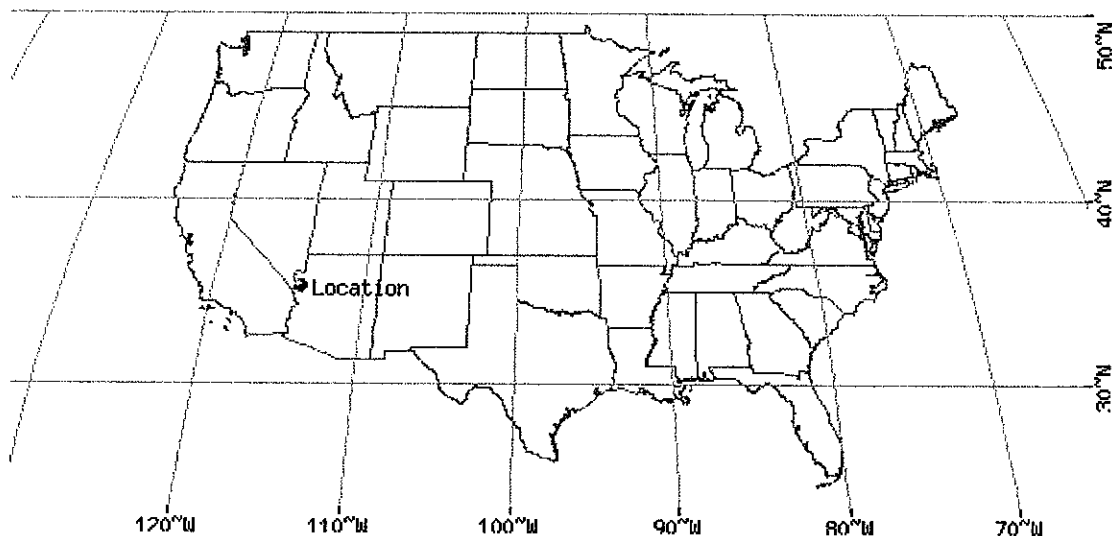
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.19	0.29	0.36	0.49	0.60	0.69	0.76	0.91	1.06	1.34	1.55	1.71	1.95	2.10	2.56	3.01	3.45	3.87
5	0.28	0.42	0.52	0.70	0.87	0.98	1.06	1.25	1.45	1.84	2.12	2.31	2.64	2.87	3.52	4.15	4.80	5.40
10	0.33	0.51	0.63	0.85	1.05	1.19	1.29	1.51	1.77	2.23	2.56	2.79	3.16	3.46	4.22	4.98	5.78	6.50
25	0.41	0.62	0.78	1.04	1.29	1.47	1.60	1.86	2.16	2.74	3.16	3.40	3.85	4.25	5.14	6.07	7.05	7.96
50	0.46	0.70	0.87	1.18	1.46	1.70	1.86	2.13	2.46	3.14	3.62	3.88	4.37	4.85	5.86	6.85	7.99	9.02
100	0.52	0.79	0.98	1.32	1.63	1.92	2.12	2.41	2.77	3.55	4.10	4.37	4.91	5.46	6.58	7.64	8.92	10.07
200	0.57	0.87	1.08	1.46	1.80	2.14	2.37	2.70	3.08	3.96	4.58	4.86	5.43	6.07	7.29	8.41	9.86	11.13
500	0.65	0.98	1.22	1.64	2.03	2.46	2.74	3.08	3.48	4.52	5.25	5.52	6.14	6.91	8.23	9.40	11.06	12.46
1000	0.70	1.06	1.32	1.78	2.20	2.68	3.03	3.38	3.80	4.94	5.76	6.03	6.69	7.57	8.92	10.12	11.96	13.46

* The lower bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are less than.

** These precipitation frequency estimates are based on a partial duration maxima series. ARI is the Average Recurrence Interval.

Please refer to the [documentation](#) for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

Maps -



These maps were produced using a direct map request from the U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server.

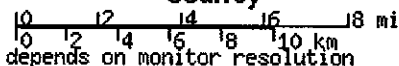
Please read [disclaimer](#) for more information.

LEGEND

- State
- County
- Indian Resv
- Lake/Pond/Ocean
- Street
- Expressway
- Highway
- Connector
- Stream
- Military Area
- National Park
- Other Park
- City
- County

Scale 1:228583

*average--true scale depends on monitor resolution



Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the [National Digital Orthophoto Program \(NDOP\)](#) for more information.

Watershed/Stream Flow Information -

[Find the Watershed](#) for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study, please refer to our documentation.

Using the [National Climatic Data Center's \(NCDC\)](#) station search engine, locate other climate stations within:

+/-30 minutes ...OR... **+/-1 degree** of this location (35.14/-114.18). Digital ASCII data can be obtained directly from [NCDC](#).

Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOWpack TELemetry) stations by visiting the [Western Regional Climate Center's state-specific SNOTEL station maps](#).

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910
(301) 713-1669
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)

GOLDEN VALLEY RANCH

APPENDIX B

DRAINAGE INFRASTRUCTURE CALCULATIONS

- **COMMON LOT O (P1-83)**
- **COMMON LOT F (J-C14)**
- **COMMON LOT E (J-C17)**
- **H STREET (J-C21)**
- **COMMON LOT D (J-C25)**

REVISIONS	DWN	APVD	APVD	DATE



NO.	REV.
A	0

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway PavementsInlets on Sag
Date: 03/10/2006Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
 SAG INLETS - ALL PODS
 MODIFIED "C" L-17.5
 SHERO P1-83 INLET A Common Lot. "G"
 Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope	Composite/Dep
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	8.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.00
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	7.38
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.521
d_curb	Depth at Curb (ft)	0.667
Qi	Intercepted Flow (cfs)	15.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet**Worksheet for Triangular Channel****Project Description**

Worksheet	COMMON LOT G - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.020
Channel Slope	0.005000 ft/ft
Left Side Slope	28.80 H : V
Right Side Slope	28.80 H : V
Discharge	24.00 cfs

Results

Depth	0.60 ft
Flow Area	10.2 ft ²
Wetted Perimeter	34.36 ft
Top Width	34.34 ft
Critical Depth	0.53 ft
Critical Slope	0.009063 ft/ft
Velocity	2.34 ft/s
Velocity Head	0.09 ft
Specific Energy	0.68 ft
Froude Number	0.76
Flow Type	Subcritical

VELOCITY x DEPTH.

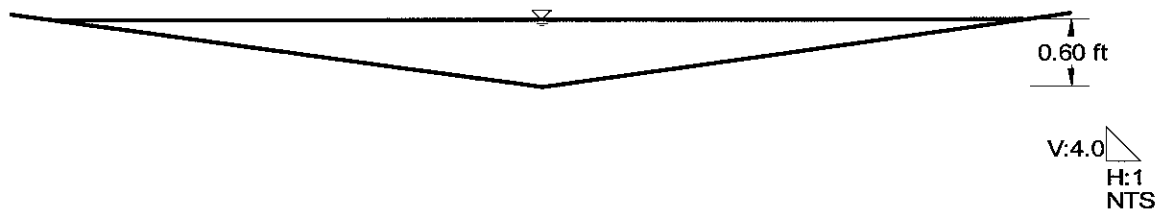
$$2.3 \times 0.6 = 1.4 < 6.0$$

Cross Section

Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT G - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

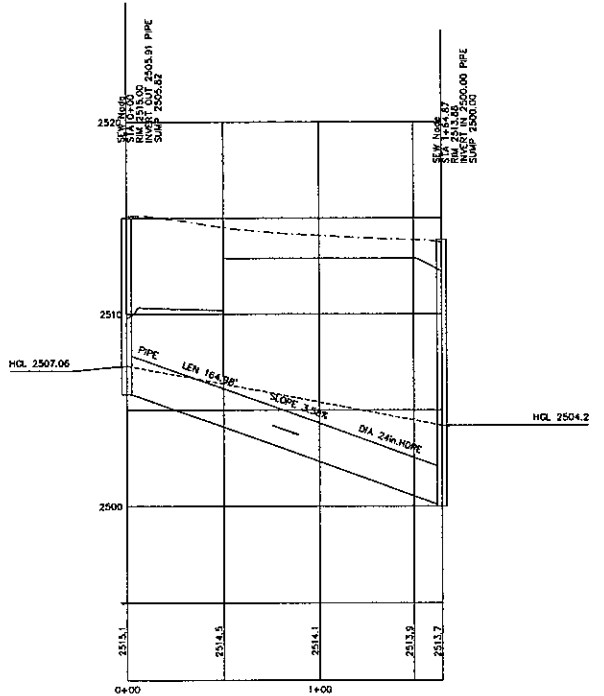
Section Data	
Mannings Coefficient	0.020
Channel Slope	0.005000 ft/ft
Depth	0.60 ft
Left Side Slope	28.80 H : V
Right Side Slope	28.80 H : V
Discharge	24.00 cfs



Q:\18449\dwg\design\SD_PRO\POD1\POD1_Jstr_CULDESAC.dwg, 3/16/2006 5:45:52 PM, \\vg-ps1\hp5100-eng, 1:1


\$\$\$\$\$FILENAME\$\$\$\$\$

CADD A1-R3 © STANLEY CONSULTANTS



HS 1" = 100'
VS 1" = 10'

LEGEND	
---	Existing Grade
---	Finish Grade
---	HGL

 Stanley Consultants INC.					SCALE NO. A REV. 0	
REVISIONS DESIGNED RJM DRAWN RN CHECKED APPROVED APPROVED DATE DATE	DWN	APVD	APVD	DATE	RHODES HOMES ARIZONA GOLDEN VALLEY RANCH AREA 1 - PHASE A	
COMMON LOT 0 SHED P1-83						

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

EASEMENT DETAIL J STREET TO GOLF COURSE - 15CFS - P183

ST-RH036346

DATE: 3/14/2006
TIME: 13:45

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD	SECT	CHN	NO OF	AVE PIER	HEIGHT 1	BASE	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CODE	NO	TYPE	PIERS	WIDTH	DIAMETER	WIDTH			DROP										
CD	24	4				2.00													

F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1	IS A SYSTEM OUTLET	*	*	*										
		U/S DATA	STATION	INVERT	SECT			W S ELEV							
			100.00	2500.00	24			2504.20							
ELEMENT NO	2	IS A REACH	*	*	*										
		U/S DATA	STATION	INVERT	SECT	N			RADIUS	ANGLE	ANG FT	MAN H			
			265.00	2505.91	24	0.013			0.00	0.00	0.00	0			
ELEMENT NO	3	IS A SYSTEM HEADWORKS			*		*								
		U/S DATA	STATION	INVERT	SECT			W S ELEV							
			265.00	2505.91	24			0.00							
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING															
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC															

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PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
EASEMENT DETAIL Y J STREET TO GOLF COURSE

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.ELEV.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SP AVE	HF			NORM DEPTH		ZR		
100.00	2500.00	4.200	2504.200	15.0	4.77	0.354	2504.554	0.00	1.396	2.00	0.00	0.00	0	0.00
63.12	0.03582					.004396	0.28			0.820		0.00		
163.12	2502.26	2.220	2504.481	15.0	4.77	0.354	2504.835	0.00	1.396	2.00	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00	
163.12	2502.26	0.843	2503.104	15.0	11.92	2.208	2505.312	0.00	1.396	2.00	0.00	0.00	0	0.00
18.65	0.03582					.031962	0.60			0.820		0.00		
181.77	2502.93	0.843	2503.772	15.0	11.91	2.204	2505.976	0.00	1.396	2.00	0.00	0.00	0	0.00
28.97	0.03582					.029974	0.87			0.820		0.00		
210.74	2503.97	0.874	2504.840	15.0	11.36	2.002	2506.842	0.00	1.396	2.00	0.00	0.00	0	0.00
15.73	0.03582					.026343	0.41			0.820		0.00		
226.47	2504.53	0.907	2505.437	15.0	10.83	1.821	2507.258	0.00	1.396	2.00	0.00	0.00	0	0.00
10.47	0.03582					.023157	0.24			0.820		0.00		
236.94	2504.91	0.940	2505.845	15.0	10.32	1.655	2507.500	0.00	1.396	2.00	0.00	0.00	0	0.00
7.41	0.03582					.020366	0.15			0.820		0.00		
244.35	2505.17	0.976	2506.146	15.0	9.84	1.504	2507.650	0.00	1.396	2.00	0.00	0.00	0	0.00
5.58	0.03582					.017930	0.10			0.820		0.00		
249.93	2505.37	1.013	2506.383	15.0	9.39	1.368	2507.751	0.00	1.396	2.00	0.00	0.00	0	0.00
4.26	0.03582					.015793	0.07			0.820		0.00		
254.19	2505.52	1.052	2506.575	15.0	8.95	1.244	2507.819	0.00	1.396	2.00	0.00	0.00	0	0.00
3.29	0.03582					.013924	0.05			0.820		0.00		
257.48	2505.64	1.093	2506.734	15.0	8.53	1.130	2507.864	0.00	1.396	2.00	0.00	0.00	0	0.00
2.54	0.03582					.012286	0.03			0.820		0.00		

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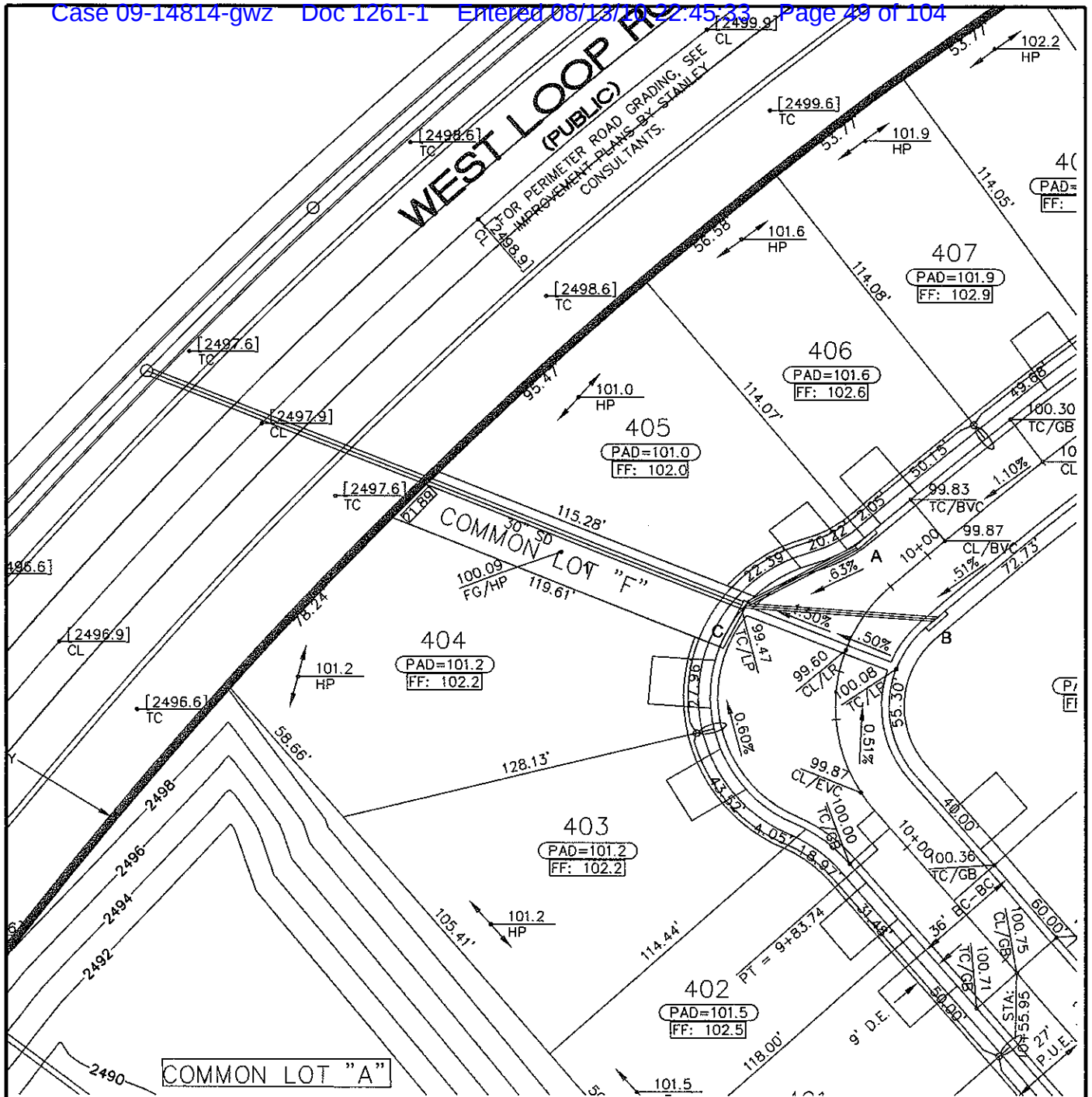
PAGE 2

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
EASEMENT DETAIL Y J STREET TO GOLF COURSE

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR	
260.02	2505.73	1.136	2506.868	15.0	8.13	1.027	2507.895	0.00	1.396	2.00	0.00	0.00	0	0.00
1.90	0.03582					.010856	0.02			0.820		0.00		
261.92	2505.80	1.182	2506.982	15.0	7.76	0.934	2507.916	0.00	1.396	2.00	0.00	0.00	0	0.00
1.41	0.03582					.009604	0.01			0.820		0.00		
263.33	2505.85	1.230	2507.080	15.0	7.40	0.849	2507.929	0.00	1.396	2.00	0.00	0.00	0	0.00
0.96	0.03582					.008507	0.01			0.820		0.00		
264.29	2505.89	1.281	2507.166	15.0	7.05	0.772	2507.938	0.00	1.396	2.00	0.00	0.00	0	0.00
0.54	0.03582					.007550	0.00			0.820		0.00		
264.83	2505.90	1.336	2507.240	15.0	6.72	0.702	2507.942	0.00	1.396	2.00	0.00	0.00	0	0.00
0.17	0.03582					.006712	0.00			0.820		0.00		
265.00	2505.91	1.396	2507.306	15.0	6.40	0.637	2507.943	0.00	1.396	2.00	0.00	0.00	0	0.00

ST-RH036350



STORM DRAIN SYSTEM

INLET	SIZE	Q _{inlet}	Q _{intercept}	Q _{bypass}	Grade/Sump
A	8.5	19	7	9	G
B	11.5	20	10	10	G
C	11.5	28	11	17	S

SD PIPES

PIPE	Q _{pipe}	Size
1	19	30

REVISIONS	DWN	APVD	APVD	DATE
DESIGNED RJM				
DRAWN RJM				
CHECKED				
APPROVED				
APPROVED				
DATE 3/02/06				



RHODES HOMES ARIZONA
GOLDEN VALLEY RANCH
AREA 1 - PHASE A

COMMON LOT F
NODE J-C14

SCALE 1" = 40'

NO.	REV.
A	0

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT F
NODE J-C14
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0063
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	19.000
T	Width of Spread (ft)	23.45

Gutter Flow

Eo	Gutter Flow Ratio	0.186
d	Depth of Flow (ft)	0.56
V	Average Velocity (ft/sec)	3.41

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	31.70	4.25	0.08	1.453	17.547
Parallel Bar P-1-7/8	1.50	2.88	0.31	5.456	12.092
Combination			0.36	6.908	12.092

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Grade
Date: 03/15/2006

Project No. :18476 - Pod 1
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description

LOT F
NODE J-C14
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0051
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	20.000
T	Width of Spread (ft)	25.00

Gutter Flow

Eo	Gutter Flow Ratio	0.174
d	Depth of Flow (ft)	0.59
V	Average Velocity (ft/sec)	3.17

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	31.15	5.75	0.08	1.555	18.445
Parallel Bar P-1-7/8	1.50	4.38	0.46	8.482	9.963
Combination			0.50	10.037	9.963

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description

SAG INLETS - ALL PODS

MODIFIED "C" L-11.5

PODS J-C14 INLET C

Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope	Composite/Dep
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	5.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.48
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	4.38
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.526
d_curb	Depth at Curb (ft)	0.671
Qi	Intercepted Flow (cfs)	11.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT F - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.020
Channel Slope	0.005000 ft/ft
Left Side Slope	28.80 H : V
Right Side Slope	28.80 H : V
Discharge	19.00 cfs

Results	
Depth	0.55 ft
Flow Area	8.6 ft ²
Wetted Perimeter	31.49 ft
Top Width	31.47 ft
Critical Depth	0.49 ft
Critical Slope	0.009350 ft/ft
Velocity	2.21 ft/s
Velocity Head	0.08 ft
Specific Energy	0.62 ft
Froude Number	0.75
Flow Type	Subcritical

VELOCITY x DEPTH

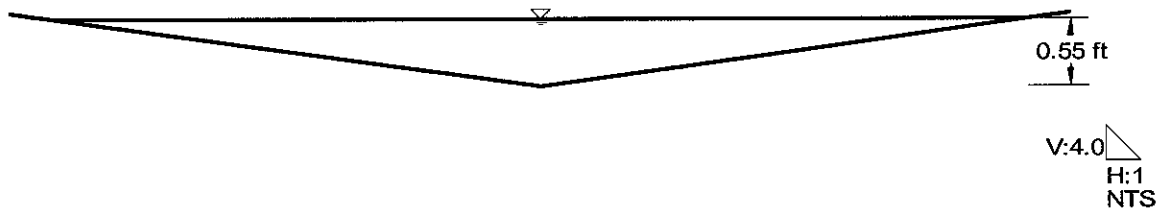
$$2.2 \times 0.6 = 1.3 < 6.0$$

Cross Section

Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT F - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

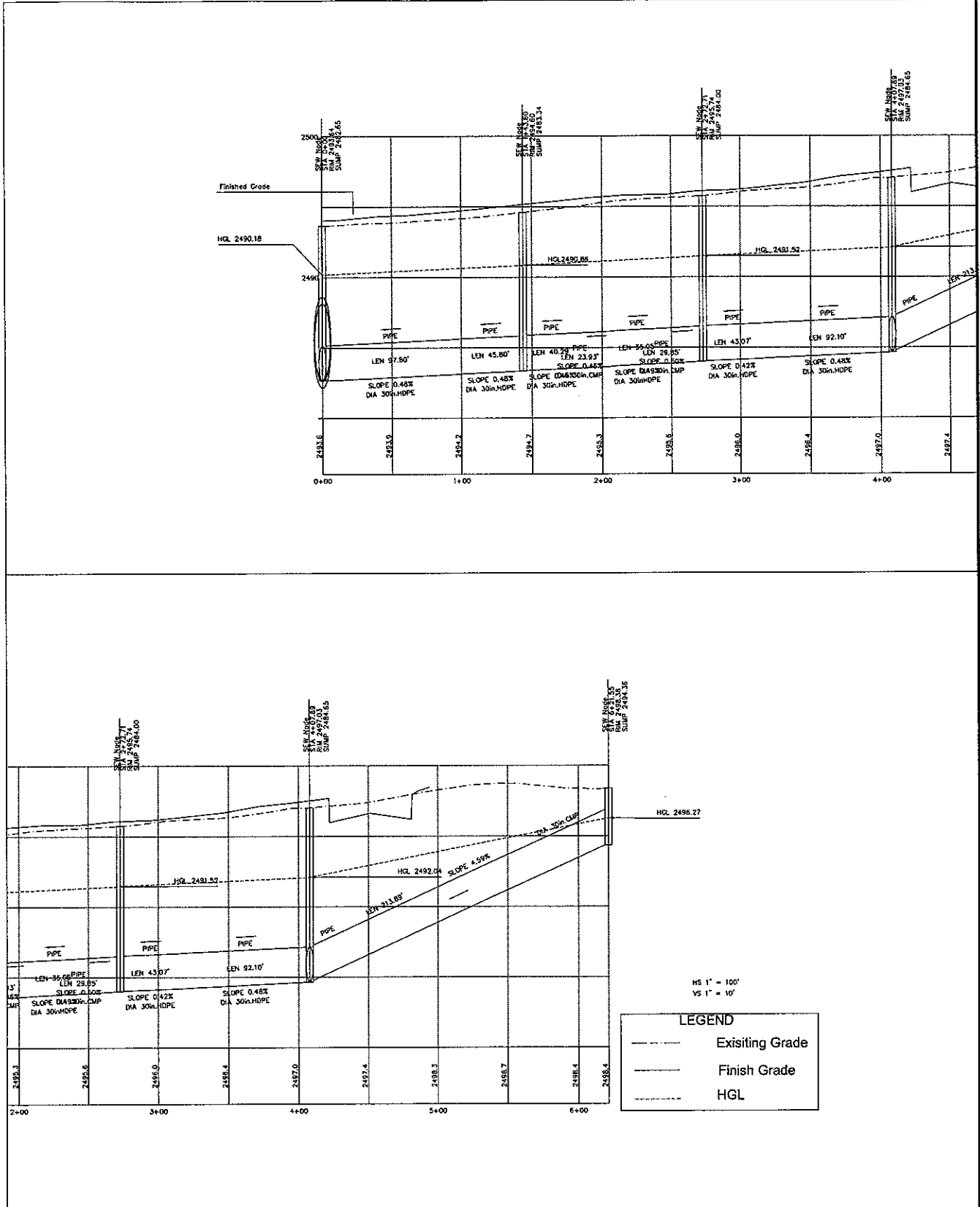
Section Data	
Mannings Coefficient	0.020
Channel Slope	0.005000 ft/ft
Depth	0.55 ft
Left Side Slope	28.80 H : V
Right Side Slope	28.80 H : V
Discharge	19.00 cfs




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CADD AT-R3 © STANLEY CONSULTANTS



<div>  Stanley Consultants INC. </div>					SCALE	
REVISIONS	DWN	APVD	APVD	DATE	NO.	REV.
DESIGNED RJM					A	0
DRAWN RN						
CHECKED						
APPROVED						
DATE DATE						
RHODES HOMES ARIZONA GOLDEN VALLEY RANCH AREA 1 - PHASE A					COMMON LOT F NODE J-C14	

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH JC14 - 28 CFS

ST-RH036359

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH JCL4 - 28 CFS AT STA 105 + ON WLPR

ST-RH036360

F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET	U/S DATA	STATION	INVERT	SECT	W S ELEV								
			100.00	2482.64	30	2490.18								
ELEMENT NO	2 IS A REACH	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
			240.00	2483.34	30	0.013	0.00	0.00	0.00	0				
ELEMENT NO	3 IS A JUNCTION	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
			245.00	2483.36	30	0	0	0.014	0.0	0.0	0.00	0.00	0.00	0.00
ELEMENT NO	4 IS A REACH	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
			372.00	2484.00	30	0.013	0.00	0.00	5.00	0				
ELEMENT NO	5 IS A JUNCTION	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
			377.00	2484.02	30	0	0	0.014	0.0	0.0	0.00	0.00	0.00	0.00
ELEMENT NO	6 IS A REACH	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
			502.00	2484.65	30	0.013	0.00	0.00	5.00	0				
ELEMENT NO	7 IS A JUNCTION	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
			507.00	2484.67	30	0	0	0.014	0.0	0.0	0.00	0.00	0.00	0.00
ELEMENT NO	8 IS A REACH	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
			715.00	2494.47	30	0.013	0.00	0.00	70.00	0				
ELEMENT NO	9 IS A SYSTEM HEADWORKS	U/S DATA	STATION	INVERT	SECT	W S ELEV								
			715.00	2494.47	30	0.00								

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W-S.ELEV = INV + DC

LICENSEE: STANLEY CONSULTANTS, INC.

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PAGE 1

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH JC14 - 28 CFS

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EV.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH		ZR		
100.00	2482.64	7.540	2490.180	28.0	5.70	0.505	2490.685	0.00	1.804	2.50	0.00	0.00	0	0.00
140.00	0.00500					.004660	0.65			1.973		0.00		
240.00	2483.34	7.492	2490.832	28.0	5.70	0.505	2491.337	0.00	1.804	2.50	0.00	0.00	0	0.00
JUNCT STR	0.00400					.005404	0.03					0.00		
245.00	2483.36	7.499	2490.859	28.0	5.70	0.505	2491.364	0.00	1.804	2.50	0.00	0.00	0	0.00
127.00	0.00504					.004660	0.59			1.970		0.00		
372.00	2484.00	7.460	2491.460	28.0	5.70	0.505	2491.965	0.00	1.804	2.50	0.00	0.00	0	0.00
JUNCT STR	0.00400					.005404	0.03					0.00		
377.00	2484.02	7.467	2491.487	28.0	5.70	0.505	2491.992	0.00	1.804	2.50	0.00	0.00	0	0.00
125.00	0.00504					.004660	0.58			1.970		0.00		
502.00	2484.65	7.427	2492.077	28.0	5.70	0.505	2492.582	0.00	1.804	2.50	0.00	0.00	0	0.00
JUNCT STR	0.00400					.005404	0.03					0.00		
507.00	2484.67	7.434	2492.104	28.0	5.70	0.505	2492.609	0.00	1.804	2.50	0.00	0.00	0	0.00
104.95	0.04711					.004660	0.49			0.961		0.00		
611.95	2489.61	3.082	2492.697	28.0	5.70	0.505	2493.202	0.00	1.804	2.50	0.00	0.00	0	0.00
HYDRAULIC JUMP												0.00		
611.95	2489.61	1.008	2490.623	28.0	15.11	3.546	2494.169	0.00	1.804	2.50	0.00	0.00	0	0.00
4.09	0.04711					.039811	0.16			0.961		0.00		
616.04	2489.81	1.008	2490.815	28.0	15.09	3.538	2494.353	0.00	1.804	2.50	0.00	0.00	0	0.00
29.13	0.04711					.037340	1.09			0.961		0.00		
645.17	2491.18	1.045	2492.225	28.0	14.40	3.218	2495.443	0.00	1.804	2.50	0.00	0.00	0	0.00
17.77	0.04711					.032787	0.58			0.961		0.00		

ST-RH036362

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F0515P

PAGE 2

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH JC14 - 28 CFS

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD. EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVEPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH		ZR		
662.94	2492.02	1.083	2493.100	28.0	13.73	2.925	2496.025	0.00	1.804	2.50	0.00	0.00	0	0.00
12.33	0.04711					.028800	0.36			0.961		0.00		
675.27	2492.60	1.123	2493.721	28.0	13.08	2.658	2496.379	0.00	1.804	2.50	0.00	0.00	0	0.00
9.17	0.04711					.025315	0.23			0.961		0.00		
684.44	2493.03	1.165	2494.195	28.0	12.48	2.418	2496.613	0.00	1.804	2.50	0.00	0.00	0	0.00
7.07	0.04711					.022267	0.16			0.961		0.00		
691.51	2493.36	1.209	2494.572	28.0	11.89	2.197	2496.769	0.00	1.804	2.50	0.00	0.00	0	0.00
5.59	0.04711					.019599	0.11			0.961		0.00		
697.10	2493.63	1.255	2494.882	28.0	11.35	1.999	2496.881	0.00	1.804	2.50	0.00	0.00	0	0.00
4.48	0.04711					.017261	0.08			0.961		0.00		
701.58	2493.84	1.303	2495.141	28.0	10.81	1.816	2496.957	0.00	1.804	2.50	0.00	0.00	0	0.00
3.57	0.04711					.015215	0.05			0.961		0.00		
705.15	2494.01	1.354	2495.360	28.0	10.31	1.652	2497.012	0.00	1.804	2.50	0.00	0.00	0	0.00
2.89	0.04711					.013424	0.04			0.961		0.00		
708.04	2494.14	1.407	2495.549	28.0	9.83	1.501	2497.050	0.00	1.804	2.50	0.00	0.00	0	0.00
2.28	0.04711					.011855	0.03			0.961		0.00		
710.32	2494.25	1.463	2495.712	28.0	9.37	1.364	2497.076	0.00	1.804	2.50	0.00	0.00	0	0.00
1.75	0.04711					.010484	0.02			0.961		0.00		
712.07	2494.33	1.523	2495.855	28.0	8.94	1.240	2497.095	0.00	1.804	2.50	0.00	0.00	0	0.00
1.31	0.04711					.009286	0.01			0.961		0.00		
713.38	2494.39	1.586	2495.980	28.0	8.52	1.128	2497.108	0.00	1.804	2.50	0.00	0.00	0	0.00
0.92	0.04711					.008237	0.01			0.961		0.00		

ST-RH036363

LICENSEE: STANLEY CONSULTANTS, INC.

F0515P

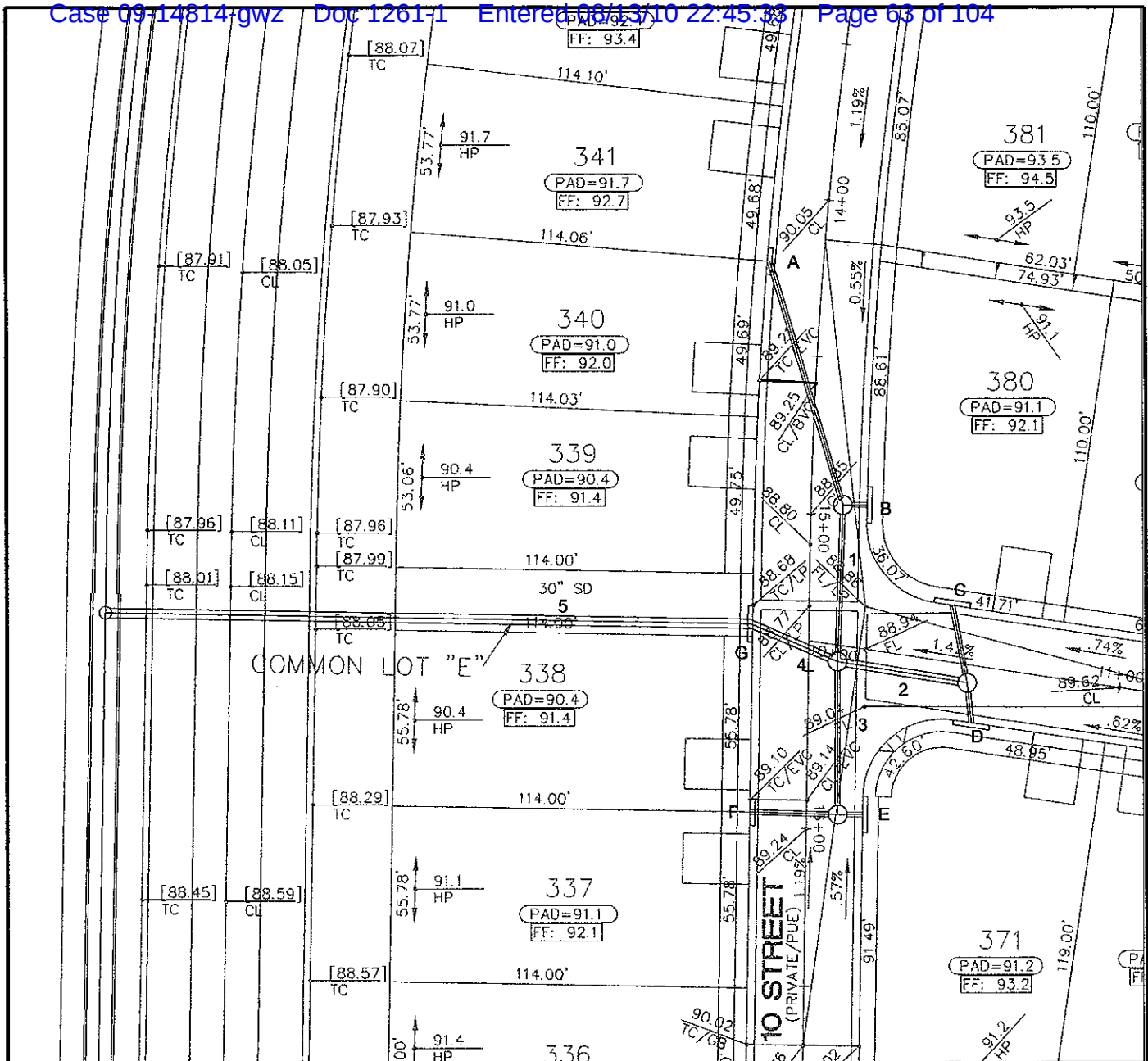
PAGE 3

WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH JC14 - 28 CFS

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.ELEV.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH				
714.30	2494.44	1.653	2496.090	28.0	8.13	1.025	2497.115	0.00	1.804	2.50	0.00	0.00	0	0.00
0.53	0.04711					.007323	0.00			0.961		0.00		
714.83	2494.46	1.725	2496.187	28.0	7.75	0.932	2497.119	0.00	1.804	2.50	0.00	0.00	0	0.00
0.17	0.04711					.006524	0.00			0.961		0.00		
715.00	2494.47	1.804	2496.274	28.0	7.38	0.846	2497.120	0.00	1.804	2.50	0.00	0.00	0	0.00

ST-RH036364



STORM DRAIN SYSTEM

INLET	SIZE	Qinlet	Qintercept	Qbypass	Grade/Sump
A	8.5	15	6	9	G
B	11.5	16	7	9	G
C	14.5	33	14	19	G
D	8.5	33	14	19	G
E	11.5	12	7	7	G
F	8.5	13	5	6	G
G	11.5	67	11	56	S

SD PIPES

PIPE	Qpipe	Size
1	13	A
2	28	B
3	12	C
4	53	D
5	64	36

REVISIONS

DESIGNED RJM
 DRAWN RJM
 CHECKED _____
 APPROVED _____
 APPROVED _____
 DATE 3/02/06

DWN

APVD

APVD

DATE



RHODES HOMES ARIZONA
 GOLDEN VALLEY RANCH
 AREA 1 - PHASE B

COMMON LOT E
 NODE J-C17

SCALE 1" = 50'

NO.

A

REV.

0

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway PavementsInlets on Grade
Date: 03/15/2006Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0119
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	15.000
T	Width of Spread (ft)	18.94

Gutter Flow

Eo	Gutter Flow Ratio	0.233
d	Depth of Flow (ft)	0.47
V	Average Velocity (ft/sec)	4.10

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	31.84	4.25	0.08	1.142	13.858
Parallel Bar P-1-7/8	1.50	2.88	0.32	4.491	9.368
Combination			0.38	5.632	9.368

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway PavementsInlets on Grade
Date: 03/15/2006Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0119
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	16.000
T	Width of Spread (ft)	19.42

Gutter Flow

Bo	Gutter Flow Ratio	0.227
d	Depth of Flow (ft)	0.48
V	Average Velocity (ft/sec)	4.16

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	33.06	5.75	0.07	1.174	14.826
Parallel Bar P-1-7/8	1.50	4.38	0.42	6.193	8.634
Combination			0.46	7.366	8.634

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway PavementsInlets on Grade
Date: 03/15/2006Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET C

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0050
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	33.000
T	Width of Spread (ft)	30.33

Gutter Flow

Eo	Gutter Flow Ratio	0.142
d	Depth of Flow (ft)	0.70
V	Average Velocity (ft/sec)	3.56

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	41.02	5.75	0.06	1.957	31.043
Parallel Bar P-1-7/8	1.50	4.38	0.40	12.308	18.734
Combination			0.43	14.266	18.734

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway PavementsInlets on Grade
Date: 03/15/2006Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET D

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0062
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	33.000
T	Width of Spread (ft)	29.12

Gutter Flow

Eo	Gutter Flow Ratio	0.148
d	Depth of Flow (ft)	0.68
V	Average Velocity (ft/sec)	3.86

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	43.13	5.75	0.06	1.863	31.137
Parallel Bar P-1-7/8	1.50	4.38	0.38	11.702	19.435
Combination			0.41	13.565	19.435

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway PavementsInlets on Grade
Date: 03/15/2006Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET E

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0050
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	12.000
T	Width of Spread (ft)	20.55

Gutter Flow

Bo	Gutter Flow Ratio	0.214
d	Depth of Flow (ft)	0.51
V	Average Velocity (ft/sec)	2.79

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	23.12	4.25	0.10	1.249	10.751
Parallel Bar P-1-7/8	1.50	2.88	0.38	4.073	6.678
Combination			0.44	5.322	6.678

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway PavementsInlets on Grade
Date: 03/15/2006Project No. :18476-Pod1
Project Name.:Golden Valley Ranch - Pod 1
Computed by :rjm

Project Description

COMMON LOT E
NODE J-C17
INLET F

Inlets on Grade: Curb Opening, Grate Inlet

Roadway and Discharge Data

	Cross Slope	Composite
S	Longitudinal Slope (ft/ft)	0.0057
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00
Q	Discharge (cfs)	13.000
T	Width of Spread (ft)	20.66

Gutter Flow

Eo	Gutter Flow Ratio	0.212
d	Depth of Flow (ft)	0.51
V	Average Velocity (ft/sec)	2.99

Inlet Interception

INLET INTERCEPTION	LT or WGR (ft)	L (ft)	E	Qi (cfs)	Qb (cfs)
Curb Opening	24.93	5.75	0.10	1.258	11.742
Parallel Bar P-1-7/8	1.50	4.38	0.51	5.948	5.795
Combination			0.55	7.205	5.795

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 03/10/2006

Project No. :18449
Project Name.:GOLDEN VALLEY RANCH
Computed by :rjm

Project Description
SAG INLETS - ALL PODS
MODIFIED "C" L-11.5
Node I-417 INLET 4
Inlets on Sag: Sweeper Combination Inlet

Roadway and Discharge Data

	Cross Slope	Composite/Dep
Sx	Pavement Cross Slope (ft/ft)	0.0100
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	2.00

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	5.75
H	Curb-Opening Height (in)	6.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	39.48
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	4.38
	Inlet Type *Sag*	Sweeper Combination
d_ave	Depth of Flow (ft)	0.526
d_curb	Depth at Curb (ft)	0.671
Qi	Intercepted Flow (cfs)	11.000

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

Worksheet

Worksheet for Triangular Channel

Project Description	
Worksheet	COMMON LOT E - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.020
Channel Slope	0.005000 ft/ft
Left Side Slope	28.80 H : V
Right Side Slope	28.80 H : V
Discharge	56.00 cfs

Results	
Depth	0.82 ft
Flow Area	19.3 ft ²
Wetted Perimeter	47.22 ft
Top Width	47.19 ft
Critical Depth	0.75 ft
Critical Slope	0.008092 ft/ft
Velocity	2.90 ft/s
Velocity Head	0.13 ft
Specific Energy	0.95 ft
Froude Number	0.80
Flow Type	Subcritical

VELOCITY x DEPTH.

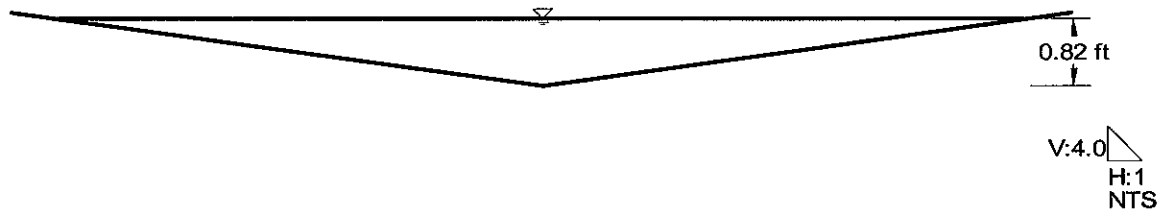
$$2.9 \times 0.8 = 2.3 < 6.0$$

Cross Section

Cross Section for Triangular Channel

Project Description	
Worksheet	COMMON LOT E - Drainage Easement - Triangular
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

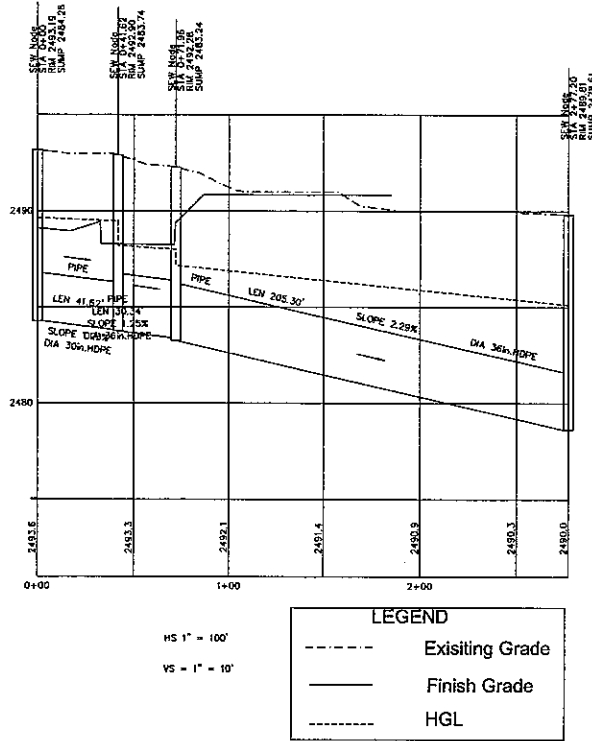
Section Data	
Mannings Coefficient	0.020
Channel Slope	0.005000 ft/ft
Depth	0.82 ft
Left Side Slope	28.80 H : V
Right Side Slope	28.80 H : V
Discharge	56.00 cfs




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\$\$\$\$\$FILENAME\$\$\$\$\$

CADD A1-R3 © STANLEY CONSULTANTS



 Stanley Consultants INC.					SCALE 1:1 NO. A REV. 0	
REVISIONS DESIGNED RJM DRAWN RN CHECKED APPROVED APPROVED DATE DATE	DWN APVD APVD DATE	RHODES HOMES ARIZONA GOLDEN VALLEY RANCH AREA 1 - PHASE B			COMMON LOT E NODE J-C17	

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH 28 CFS IN POD 2 - J-C17 STA 93 + ON WLPR

ST-RH036377

DATE: 3/15/2006
TIME: 13:11

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD	SECT	CHN	NO OF	AVE PIER	HEIGHT 1	BASE	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CODE	NO	TYPE	PIERS	WIDTH	DIAMETER	WIDTH			DROP										
CD	48	4			4.00														
CD	18	4			1.50														
CD	36	4			3.00														
CD	30	4			2.50														
CD	24	4			2.00														

F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

[illegible]

WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
 ** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

LICENSEE: STANLEY CONSULTANTS, INC.

F0515P

PAGE 1

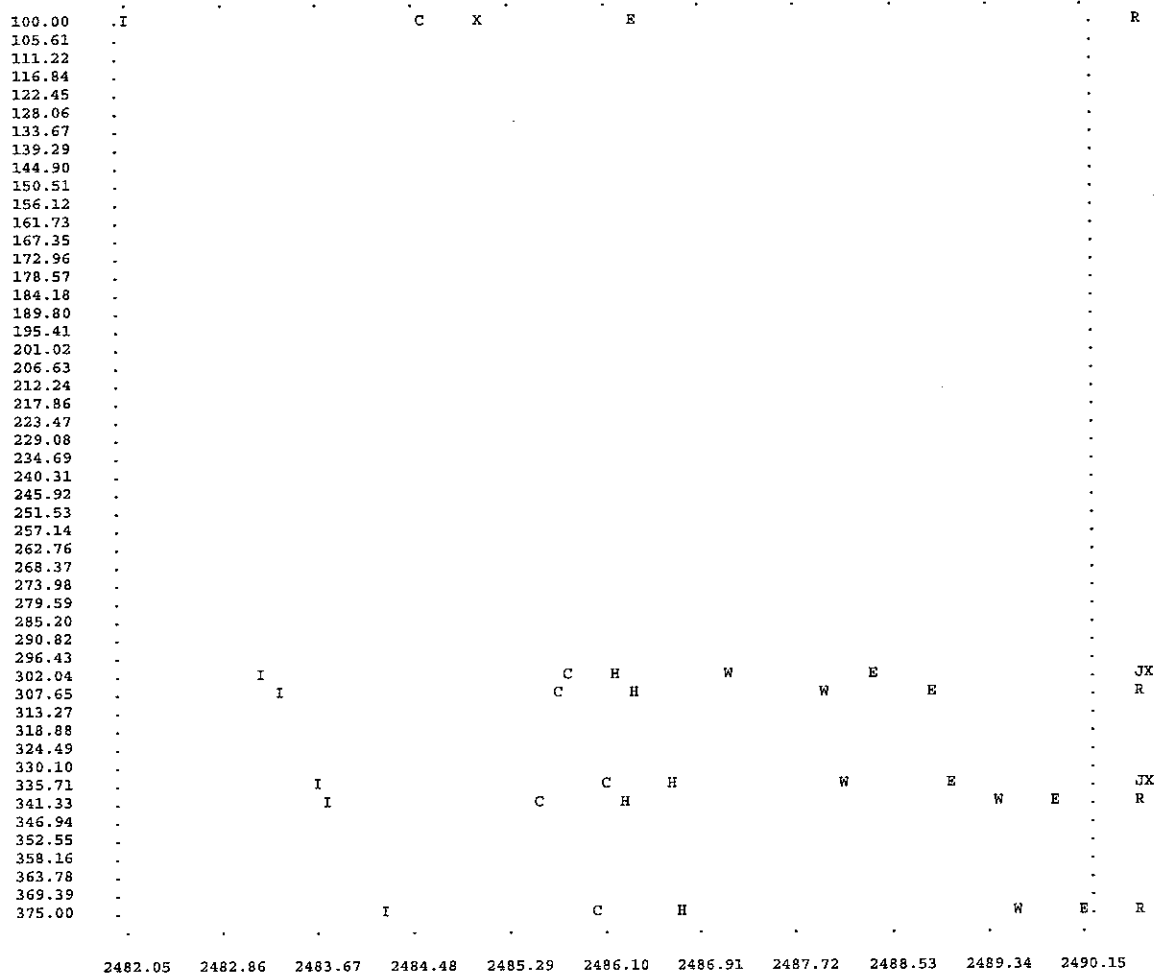
WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH 96 CFS IN POD 2 - J-C17

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL NO	AVBPR PIER
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR	
100.00	2482.05	3.060	2485.110	64.0	9.05	1.273	2486.383	0.00	2.570	3.00	0.00	0.00	0 0.00
202.00	0.00589					.009207	1.86		3.000			0.00	
302.00	2483.24	3.919	2487.159	64.0	9.05	1.273	2488.432	0.00	2.570	3.00	0.00	0.00	0 0.00
JUNCT STR	0.02400					.007761	0.04					0.00	
307.00	2483.36	4.638	2487.998	53.0	7.50	0.873	2488.871	0.00	2.366	3.00	0.00	0.00	0 0.00
25.00	0.01520					.006314	0.16		1.751			0.00	
332.00	2483.74	4.444	2488.184	53.0	7.50	0.873	2489.057	0.00	2.366	3.00	0.00	0.00	0 0.00
JUNCT STR	0.00800					.004038	0.02					0.00	
337.00	2483.78	5.683	2489.463	28.0	5.70	0.505	2489.968	0.00	1.804	2.50	0.00	0.00	0 0.00
38.00	0.01342					.004660	0.18		1.380			0.00	
375.00	2484.29	5.350	2489.640	28.0	5.70	0.505	2490.145	0.00	1.804	2.50	0.00	0.00	0 0.00

ST-RH036380

GOLDEN VALLEY RANCH
GOLDEN VALLEY
LATERAL WITH 96 CFS IN POD 2 - J-C17



NOTES

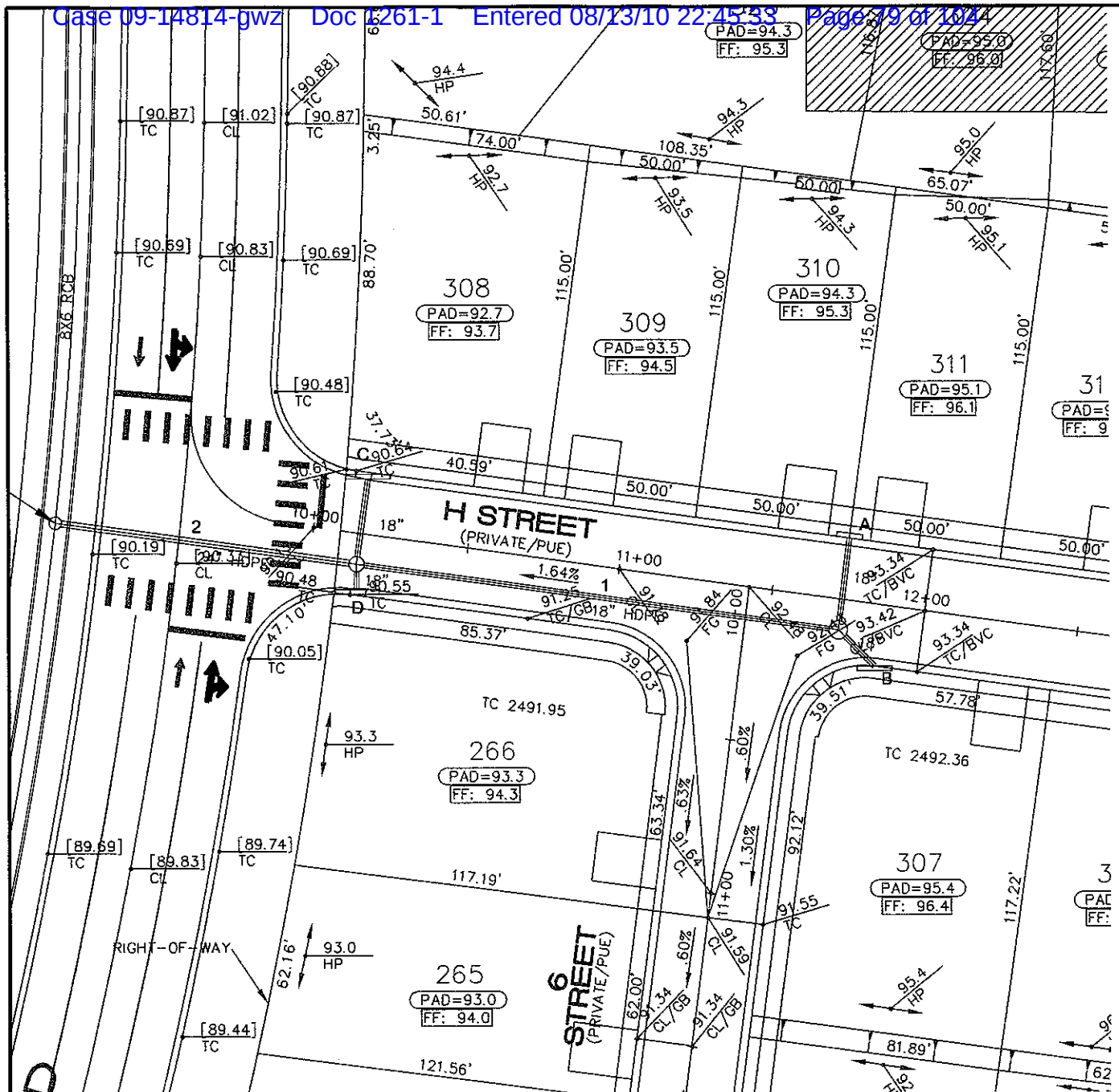
1. GLOSSARY

- ```

I = INVERT ELEVATION
C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

```

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



### STORM DRAIN SYSTEM

| INLET | SIZE | Q <sub>inlet</sub> | Q <sub>intercept</sub> | Q <sub>bypass</sub> | Grade/Sump |
|-------|------|--------------------|------------------------|---------------------|------------|
| A     | 8.5  | 27                 | 8                      | 19                  | G          |
| B     | 11.5 | 27                 | 11                     | 16                  | G          |
| C     | 11.5 | 19                 | 8                      | 11                  | G          |
| D     | 11.5 | 16                 | 7                      | 9                   | G          |

### SD PIPES

| PIPE | Q <sub>pipe</sub> | Size |
|------|-------------------|------|
| 1    | 19                | A    |
| 2    | 34                | 24   |

|              |  |  |  |  |
|--------------|--|--|--|--|
| DESIGNED RJM |  |  |  |  |
| DRAWN RJM    |  |  |  |  |
| CHECKED      |  |  |  |  |
| APPROVED     |  |  |  |  |
| APPROVED     |  |  |  |  |
| DATE 3/02/06 |  |  |  |  |



RHODES HOMES ARIZONA  
GOLDEN VALLEY RANCH  
AREA 1 - PHASE B

H STREET  
NODE J-C21

SCALE 1" = 50'

|     |      |
|-----|------|
| NO. | REV. |
| A   | 0    |

STANLEY CONSULTANTS  
CADD A1-R3

FHWA Urban Drainage Design Program, HY-22  
Drainage of Highway PavementsInlets on Grade  
Date: 03/15/2006Project No. :18476-Pod1  
Project Name.:Golden Valley Ranch - Pod 1  
Computed by :rjm

## Project Description

H STREET  
NODE J-C21  
INLET A

Inlets on Grade: Curb Opening, Grate Inlet

## Roadway and Discharge Data

|    | Cross Slope                  | Composite |
|----|------------------------------|-----------|
| S  | Longitudinal Slope (ft/ft)   | 0.0074    |
| Sx | Pavement Cross Slope (ft/ft) | 0.0200    |
| Sw | Gutter Cross Slope (ft/ft)   | 0.0833    |
| n  | Manning's Coefficient        | 0.016     |
| W  | Gutter Width (ft)            | 1.50      |
| a  | Gutter Depression (inch)     | 2.00      |
| Q  | Discharge (cfs)              | 27.000    |
| T  | Width of Spread (ft)         | 26.10     |

## Gutter Flow

|    |                           |       |
|----|---------------------------|-------|
| Bo | Gutter Flow Ratio         | 0.166 |
| d  | Depth of Flow (ft)        | 0.62  |
| V  | Average Velocity (ft/sec) | 3.92  |

## Inlet Interception

| INLET<br>INTERCEPTION | LT or WGR<br>(ft) | L<br>(ft) | E    | Qi<br>(cfs) | Qb<br>(cfs) |
|-----------------------|-------------------|-----------|------|-------------|-------------|
| Curb Opening          | 40.16             | 4.25      | 0.06 | 1.635       | 25.365      |
| Parallel Bar P-1-7/8  | 1.50              | 2.88      | 0.27 | 6.793       | 18.572      |
| Combination           |                   |           | 0.31 | 8.428       | 18.572      |

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.



FHWA Urban Drainage Design Program, HY-22  
Drainage of Highway PavementsInlets on Grade  
Date: 03/15/2006Project No. :18476-Pod1  
Project Name.:Golden Valley Ranch - Pod 1  
Computed by :rjm

## Project Description

H STREET  
NODE J-C21  
INLET B

Inlets on Grade: Curb Opening, Grate Inlet

## Roadway and Discharge Data

|    | Cross Slope                  | Composite |
|----|------------------------------|-----------|
| S  | Longitudinal Slope (ft/ft)   | 0.0074    |
| Sx | Pavement Cross Slope (ft/ft) | 0.0200    |
| Sw | Gutter Cross Slope (ft/ft)   | 0.0833    |
| n  | Manning's Coefficient        | 0.016     |
| W  | Gutter Width (ft)            | 1.50      |
| a  | Gutter Depression (inch)     | 2.00      |
| Q  | Discharge (cfs)              | 27.000    |
| T  | Width of Spread (ft)         | 26.10     |

## Gutter Flow

|    |                           |       |
|----|---------------------------|-------|
| Bo | Gutter Flow Ratio         | 0.166 |
| d  | Depth of Flow (ft)        | 0.62  |
| V  | Average Velocity (ft/sec) | 3.92  |

## Inlet Interception

| INLET<br>INTERCEPTION | LT or WGR<br>(ft) | L<br>(ft) | E    | Qi<br>(cfs) | Qb<br>(cfs) |
|-----------------------|-------------------|-----------|------|-------------|-------------|
| Curb Opening          | 40.16             | 5.75      | 0.06 | 1.635       | 25.365      |
| Parallel Bar P-1-7/8  | 1.50              | 4.38      | 0.39 | 9.772       | 15.592      |
| Combination           |                   |           | 0.42 | 11.408      | 15.592      |

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22  
Drainage of Highway PavementsInlets on Grade  
Date: 03/15/2006Project No. :18476-Pod1  
Project Name.:Golden Valley Ranch - Pod 1  
Computed by :rjm

## Project Description

H STREET  
NODE J-C21  
INLET C

Inlets on Grade: Curb Opening, Grate Inlet

## Roadway and Discharge Data

|    | Cross Slope                  | Composite |
|----|------------------------------|-----------|
| S  | Longitudinal Slope (ft/ft)   | 0.0164    |
| Sx | Pavement Cross Slope (ft/ft) | 0.0200    |
| Sw | Gutter Cross Slope (ft/ft)   | 0.0833    |
| n  | Manning's Coefficient        | 0.016     |
| W  | Gutter Width (ft)            | 1.50      |
| a  | Gutter Depression (inch)     | 2.00      |
| Q  | Discharge (cfs)              | 19.000    |
| T  | Width of Spread (ft)         | 19.51     |

## Gutter Flow

|    |                           |       |
|----|---------------------------|-------|
| Eo | Gutter Flow Ratio         | 0.226 |
| d  | Depth of Flow (ft)        | 0.49  |
| V  | Average Velocity (ft/sec) | 4.90  |

## Inlet Interception

| INLET<br>INTERCEPTION | LT or WGR<br>(ft) | L<br>(ft) | E    | Qi<br>(cfs) | Qb<br>(cfs) |
|-----------------------|-------------------|-----------|------|-------------|-------------|
| Curb Opening          | 39.20             | 5.75      | 0.06 | 1.179       | 17.821      |
| Parallel Bar P-1-7/8  | 1.50              | 4.38      | 0.38 | 6.725       | 11.096      |
| Combination           |                   |           | 0.42 | 7.904       | 11.096      |

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.

FHWA Urban Drainage Design Program, HY-22  
Drainage of Highway PavementsInlets on Grade  
Date: 03/15/2006Project No. :18476-Pod1  
Project Name.:Golden Valley Ranch - Pod 1  
Computed by :rjm

## Project Description

H STREET  
NODE J-C21  
INLET D

Inlets on Grade: Curb Opening, Grate Inlet

## Roadway and Discharge Data

|    | Cross Slope                  | Composite |
|----|------------------------------|-----------|
| S  | Longitudinal Slope (ft/ft)   | 0.0164    |
| Sx | Pavement Cross Slope (ft/ft) | 0.0200    |
| Sw | Gutter Cross Slope (ft/ft)   | 0.0833    |
| n  | Manning's Coefficient        | 0.016     |
| W  | Gutter Width (ft)            | 1.50      |
| a  | Gutter Depression (inch)     | 2.00      |
| Q  | Discharge (cfs)              | 16.000    |
| T  | Width of Spread (ft)         | 18.25     |

## Gutter Flow

|    |                           |       |
|----|---------------------------|-------|
| Eo | Gutter Flow Ratio         | 0.242 |
| d  | Depth of Flow (ft)        | 0.46  |
| V  | Average Velocity (ft/sec) | 4.70  |

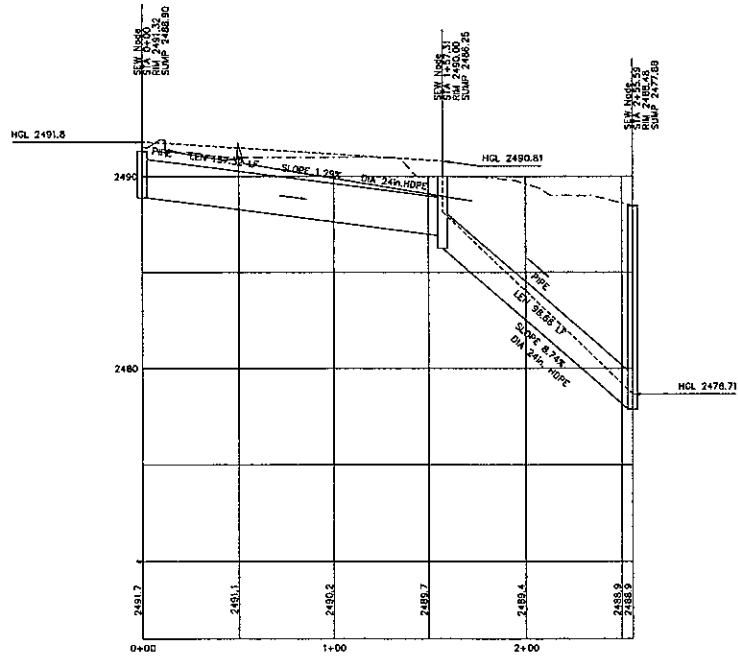
## Inlet Interception

| INLET<br>INTERCEPTION | LT or WGR<br>(ft) | L<br>(ft) | E    | Qi<br>(cfs) | Qb<br>(cfs) |
|-----------------------|-------------------|-----------|------|-------------|-------------|
| Curb Opening          | 35.45             | 5.75      | 0.07 | 1.096       | 14.904      |
| Parallel Bar P-1-7/8  | 1.50              | 4.38      | 0.40 | 5.971       | 8.933       |
| Combination           |                   |           | 0.44 | 7.067       | 8.933       |

Note: The curb opening length in the input screen is the total length of the curb opening including its length along the grate.


Q:\18449\dwg\design\SD\_PRO\POD1\WLR\_STA85+08.dwg, 3/16/2006 5:47:11 PM, \\vg-ps1\hp5100-eng, 1:1

\$\$\$ FILENAME \$\$\$  
 CADD A1-R3 © STANLEY CONSULTANTS



HS 1" = 100'  
 VS 1" = 10'

| LEGEND |                |
|--------|----------------|
| ---    | Existing Grade |
| —      | Finish Grade   |
| ...    | HGL            |

|                                                                                                                        |                             |                                              |  |  |                                         |  |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------|--|--|-----------------------------------------|--|
| <br><b>Stanley Consultants INC.</b> |                             |                                              |  |  | SCALE<br>NO. A REV. 0                   |  |
| REVISIONS<br>DESIGNED RJM<br>DRAWN RN<br>CHECKED _____<br>APPROVED _____<br>APPROVED _____<br>DATE DATE                | DWN<br>APVD<br>APVD<br>DATE | RHODES VALLEY ARIZONA<br>GOLDEN VALLEY RANCH |  |  | H STREET<br>NODE J-C21<br>DRAWING_TITLE |  |

ST-RH036387

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

LATERAL WITH FLOW 19 CFS J-C21 STA 85 + WLR

ST-RH036388

DATE: 3/20/2006  
TIME: 8:18

F0515P  
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

| CARD<br>CODE | SECT<br>NO | CHN<br>TYPE | NO OF<br>PIERS | AVE PIER<br>WIDTH | HEIGHT 1<br>DIAMETER | BASE<br>WIDTH | ZL | ZR | INV<br>DROP | Y(1) | Y(2) | Y(3) | Y(4) | Y(5) | Y(6) | Y(7) | Y(8) | Y(9) | Y(10) |
|--------------|------------|-------------|----------------|-------------------|----------------------|---------------|----|----|-------------|------|------|------|------|------|------|------|------|------|-------|
| CD           | 24         | 4           |                |                   | 2.00                 |               |    |    |             |      |      |      |      |      |      |      |      |      |       |
| CD           | 30         | 4           |                |                   | 2.50                 |               |    |    |             |      |      |      |      |      |      |      |      |      |       |
| CD           | 18         | 4           |                |                   | 1.50                 |               |    |    |             |      |      |      |      |      |      |      |      |      |       |

ST-RH036389





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F0515P

PAGE 1

## WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH  
GOLDEN VALLEY  
LATERAL WITH FLOW 35CFS J-C21

| STATION        | INVERT<br>ELEV | DEPTH<br>OF FLOW | W.S.<br>ELEV | Q    | VEL   | VEL<br>HEAD | ENERGY<br>GRD.EL. | SUPER<br>ELEV | CRITICAL<br>DEPTH | HGT/<br>DIA | BASE/<br>ID NO. | ZL   | NO<br>PIER | AVBPR |
|----------------|----------------|------------------|--------------|------|-------|-------------|-------------------|---------------|-------------------|-------------|-----------------|------|------------|-------|
| L/ELEM         | SO             |                  |              |      |       | SF AVE      | HF                |               |                   | NORM DEPTH  |                 |      |            |       |
| 100.00         | 2474.18        | 7.700            | 2481.880     | 34.0 | 10.82 | 1.818       | 2483.698          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 26.12          | 0.12979        |                  |              |      |       | .022588     | 0.59              |               |                   | 0.900       |                 | 0.00 |            |       |
| 126.12         | 2477.57        | 4.907            | 2482.478     | 34.0 | 10.82 | 1.818       | 2484.296          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| HYDRAULIC JUMP |                |                  |              |      |       |             |                   |               |                   |             |                 |      |            | 0.00  |
| 126.12         | 2477.57        | 0.996            | 2478.567     | 34.0 | 21.75 | 7.348       | 2485.915          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 6.27           | 0.12979        |                  |              |      |       | .089790     | 0.56              |               |                   | 0.900       |                 | 0.00 |            |       |
| 132.39         | 2478.38        | 1.007            | 2479.390     | 34.0 | 21.44 | 7.136       | 2486.526          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 12.95          | 0.12979        |                  |              |      |       | .082740     | 1.07              |               |                   | 0.900       |                 | 0.00 |            |       |
| 145.34         | 2480.07        | 1.046            | 2481.111     | 34.0 | 20.43 | 6.483       | 2487.594          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 9.65           | 0.12979        |                  |              |      |       | .072956     | 0.70              |               |                   | 0.900       |                 | 0.00 |            |       |
| 154.99         | 2481.32        | 1.087            | 2482.404     | 34.0 | 19.48 | 5.895       | 2488.299          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 7.54           | 0.12979        |                  |              |      |       | .064385     | 0.49              |               |                   | 0.900       |                 | 0.00 |            |       |
| 162.53         | 2482.30        | 1.130            | 2483.425     | 34.0 | 18.58 | 5.360       | 2488.785          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 6.06           | 0.12979        |                  |              |      |       | .056871     | 0.34              |               |                   | 0.900       |                 | 0.00 |            |       |
| 168.59         | 2483.08        | 1.175            | 2484.258     | 34.0 | 17.72 | 4.874       | 2489.132          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 4.97           | 0.12979        |                  |              |      |       | .050296     | 0.25              |               |                   | 0.900       |                 | 0.00 |            |       |
| 173.56         | 2483.73        | 1.223            | 2484.950     | 34.0 | 16.89 | 4.430       | 2489.380          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 4.14           | 0.12979        |                  |              |      |       | .044540     | 0.18              |               |                   | 0.900       |                 | 0.00 |            |       |
| 177.70         | 2484.26        | 1.273            | 2485.537     | 34.0 | 16.11 | 4.028       | 2489.565          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 3.46           | 0.12979        |                  |              |      |       | .039507     | 0.14              |               |                   | 0.900       |                 | 0.00 |            |       |
| 181.16         | 2484.71        | 1.327            | 2486.040     | 34.0 | 15.35 | 3.659       | 2489.699          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 2.90           | 0.12979        |                  |              |      |       | .035130     | 0.10              |               |                   | 0.900       |                 | 0.00 |            |       |

ST-RH036391

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F0515P

PAGE 2

## WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH  
GOLDEN VALLEY  
LATERAL WITH FLOW 35CFS J-C21

| STATION   | INVERT<br>ELEV | DEPTH<br>OF FLOW | W.S.<br>ELEV | Q    | VEL   | VEL<br>HEAD | ENERGY<br>GRD.EL. | SUPER<br>ELEV | CRITICAL<br>DEPTH | HGT/<br>DIA | BASE/<br>ID NO. | ZL   | NO<br>PIER | AVBPR |
|-----------|----------------|------------------|--------------|------|-------|-------------|-------------------|---------------|-------------------|-------------|-----------------|------|------------|-------|
| L/ELEM    | SO             |                  |              |      |       | SF AVE      | HF                |               |                   | NORM DEPTH  |                 | ZR   |            |       |
| 184.06    | 2485.09        | 1.385            | 2486.475     | 34.0 | 14.64 | 3.326       | 2489.801          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 2.43      | 0.12979        |                  |              |      |       | .031331     | 0.08              |               |                   | 0.900       |                 | 0.00 |            |       |
| 186.49    | 2485.41        | 1.448            | 2486.853     | 34.0 | 13.96 | 3.025       | 2489.878          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 2.05      | 0.12979        |                  |              |      |       | .028033     | 0.06              |               |                   | 0.900       |                 | 0.00 |            |       |
| 188.54    | 2485.67        | 1.515            | 2487.186     | 34.0 | 13.31 | 2.750       | 2489.936          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 1.67      | 0.12979        |                  |              |      |       | .025198     | 0.04              |               |                   | 0.900       |                 | 0.00 |            |       |
| 190.21    | 2485.89        | 1.590            | 2487.478     | 34.0 | 12.69 | 2.499       | 2489.977          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 1.33      | 0.12979        |                  |              |      |       | .022829     | 0.03              |               |                   | 0.900       |                 | 0.00 |            |       |
| 191.54    | 2486.06        | 1.675            | 2487.735     | 34.0 | 12.10 | 2.273       | 2490.008          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 0.98      | 0.12979        |                  |              |      |       | .020949     | 0.02              |               |                   | 0.900       |                 | 0.00 |            |       |
| 192.52    | 2486.19        | 1.775            | 2487.962     | 34.0 | 11.53 | 2.065       | 2490.027          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 0.48      | 0.12979        |                  |              |      |       | .019878     | 0.01              |               |                   | 0.900       |                 | 0.00 |            |       |
| 193.00    | 2486.25        | 1.911            | 2488.161     | 34.0 | 11.00 | 1.878       | 2490.039          | 0.00          | 1.911             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| JUNCT STR | 0.13000        |                  |              |      |       | .013336     | 0.07              |               |                   |             |                 | 0.00 |            |       |
| 198.00    | 2486.90        | 3.908            | 2490.808     | 19.0 | 6.05  | 0.568       | 2491.376          | 0.00          | 1.568             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |
| 152.00    | 0.01336        |                  |              |      |       | .007054     | 1.07              |               |                   | 1.262       |                 | 0.00 |            |       |
| 350.00    | 2488.93        | 2.950            | 2491.880     | 19.0 | 6.05  | 0.568       | 2492.448          | 0.00          | 1.568             | 2.00        | 0.00            | 0.00 | 0          | 0.00  |

ST-RH036392

GOLDEN VALLEY RANCH  
GOLDEN VALLEY  
LATERAL WITH FLOW 35CFS J-C21

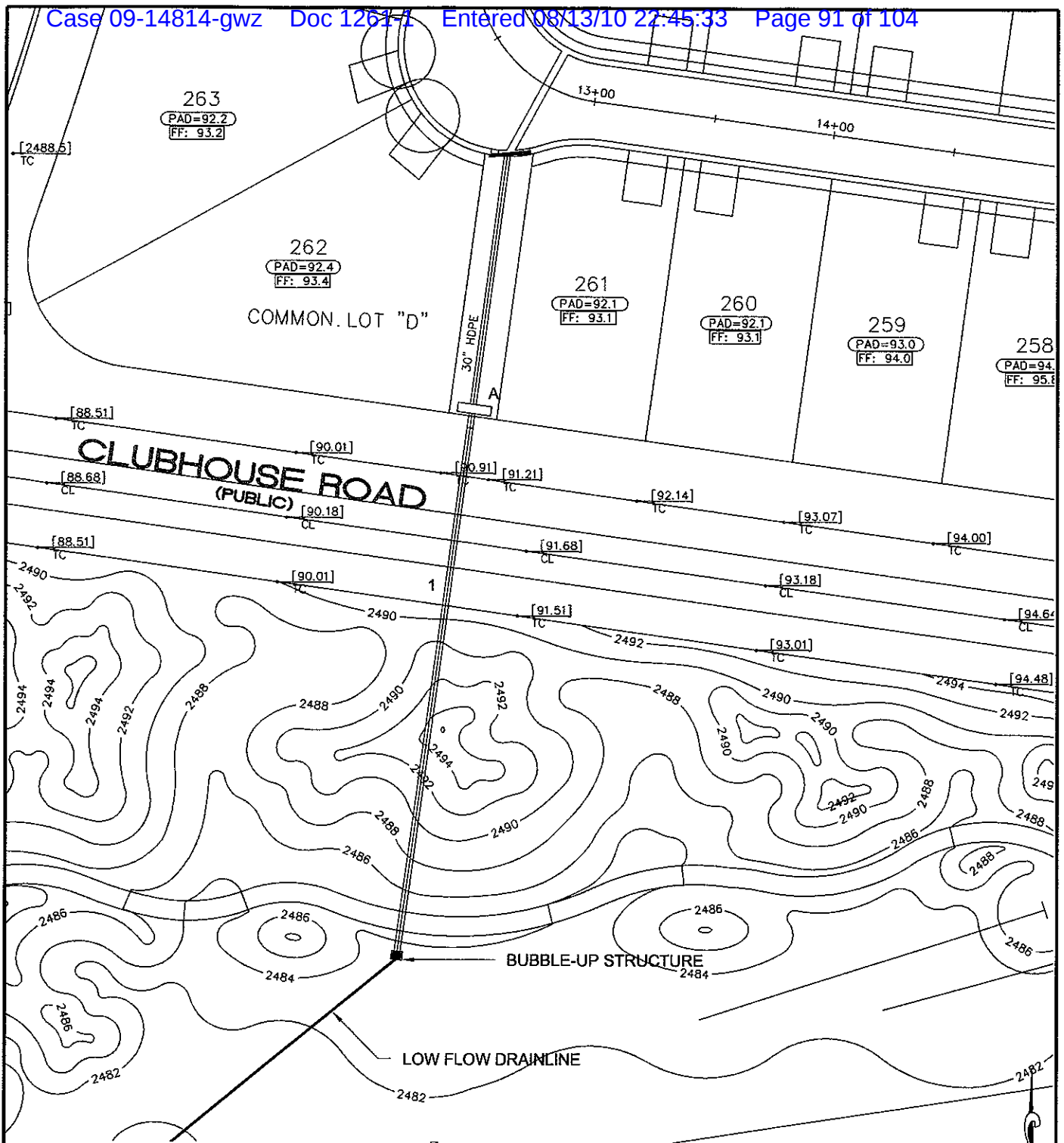
[illegible]

## NOTES

## 1. GLOSSARY

I = INVERT ELEVATION  
C = CRITICAL DEPTH  
W = WATER SURFACE ELEVATION  
H = HEIGHT OF CHANNEL  
E = ENERGY GRADE LINE  
X = CURVES CROSSING OVER  
B = BRIDGE ENTRANCE OR EXIT  
Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



### STORM DRAIN SYSTEM

| INLET | SIZE | Q <sub>inlet</sub> | Q <sub>intercept</sub> | Q <sub>bypass</sub> | Grade/Sump |
|-------|------|--------------------|------------------------|---------------------|------------|
| A     | 14.5 | 73                 | 12                     | 61                  | S          |

### SD PIPES

| PIPE | Q <sub>pipe</sub> | Size |
|------|-------------------|------|
| 1    | 12                | A    |

### REVISIONS

DESIGNED RJM  
 DRAWN RJM  
 CHECKED \_\_\_\_\_  
 APPROVED \_\_\_\_\_  
 DATE 3/02/06

DWN APVD APVD DATE

RHODES HOMES ARIZONA  
 GOLDEN VALLEY RANCH  
 AREA 1 - PHASE B

COMMON LOT D  
 NODE J-C25

SCALE 1" = 60'

| NO. | REV. |
|-----|------|
| A   | 0    |

\$\$\$ FILENAME: STANLEY CONSULTANTS CADD AT-R3

FHWA Urban Drainage Design Program, HY-22  
Drainage of Highway PavementsInlets on Sag  
Date: 03/10/2006Project No. :18449  
Project Name.:GOLDEN VALLEY RANCH  
Computed by :rjm

Project Description  
 SAG INLETS - ALL PODS  
 MODIFIED "C" L-14.5  
 POPE J-C25 INLET A Common Lot "D"  
 Inlets on Sag: Sweeper Combination Inlet

## Roadway and Discharge Data

|    | Cross Slope                  | Composite/Dep |
|----|------------------------------|---------------|
| Sx | Pavement Cross Slope (ft/ft) | 0.0100        |
| Sw | Gutter Cross Slope (ft/ft)   | 0.0833        |
| n  | Manning's Coefficient        | 0.016         |
| W  | Gutter Width (ft)            | 1.50          |
| a  | Gutter Depression (inch)     | 2.00          |

## Inlet Interception

|                   | Inlet Type *Sag*         | Curb-Opening         |
|-------------------|--------------------------|----------------------|
| L                 | Curb-Opening Length (ft) | 5.75                 |
| H                 | Curb-Opening Height (in) | 6.00                 |
|                   | Inlet Type *Sag*         | Parallel Bar P-1-7/8 |
| T                 | Width of Spread (ft)     | 39.39                |
| WGR               | Grate Width (ft)         | 1.50                 |
| L                 | Grate Length (ft)        | 5.88                 |
|                   | Inlet Type *Sag*         | Sweeper Combination  |
| d <sub>ave</sub>  | Depth of Flow (ft)       | 0.525                |
| d <sub>curb</sub> | Depth at Curb (ft)       | 0.671                |
| Qi                | Intercepted Flow (cfs)   | 12.000               |

Note: The curb opening length in the input screen is the total of the curb opening including its length along the grate.

## Worksheet

## Worksheet for Triangular Channel

| Project Description |                                               |
|---------------------|-----------------------------------------------|
| Worksheet           | COMMON LOT D - Drainage Easement - Triangular |
| Flow Element        | Triangular Channel                            |
| Method              | Manning's Formula                             |
| Solve For           | Channel Depth                                 |

| Input Data           |                |
|----------------------|----------------|
| Mannings Coefficient | 0.020          |
| Channel Slope        | 0.005000 ft/ft |
| Left Side Slope      | 28.80 H : V    |
| Right Side Slope     | 28.80 H : V    |
| Discharge            | 61.00 cfs      |

| Results          |                      |
|------------------|----------------------|
| Depth            | 0.85 ft              |
| Flow Area        | 20.6 ft <sup>2</sup> |
| Wetted Perimeter | 48.76 ft             |
| Top Width        | 48.73 ft             |
| Critical Depth   | 0.77 ft              |
| Critical Slope   | 0.008000 ft/ft       |
| Velocity         | 2.96 ft/s            |
| Velocity Head    | 0.14 ft              |
| Specific Energy  | 0.98 ft              |
| Froude Number    | 0.80                 |
| Flow Type        | Subcritical          |

VELOCITY x DEPTH.

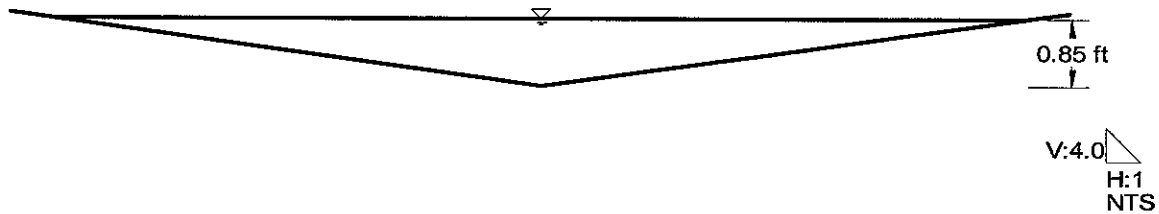
$$3.0 \times 0.9 = 2.7 \text{ cfs}$$

# Cross Section

## Cross Section for Triangular Channel

| Project Description |                                               |
|---------------------|-----------------------------------------------|
| Worksheet           | COMMON LOT D - Drainage Easement - Triangular |
| Flow Element        | Triangular Channel                            |
| Method              | Manning's Formula                             |
| Solve For           | Channel Depth                                 |

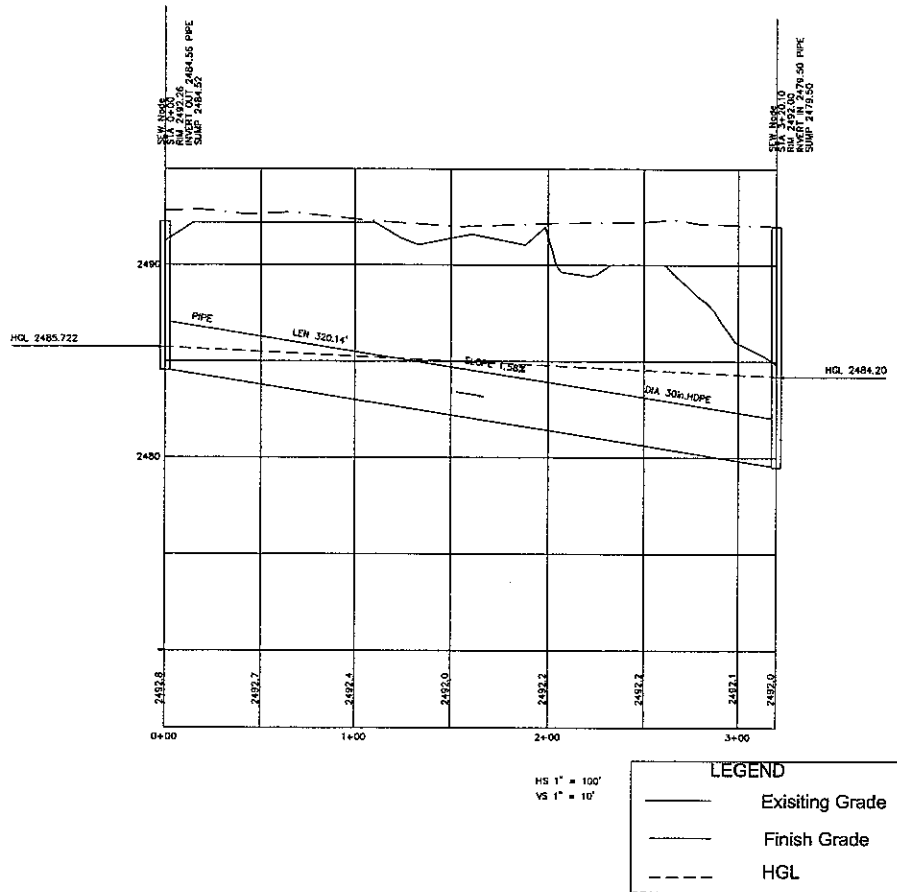
| Section Data         |                |
|----------------------|----------------|
| Mannings Coefficient | 0.020          |
| Channel Slope        | 0.005000 ft/ft |
| Depth                | 0.85 ft        |
| Left Side Slope      | 28.80 H : V    |
| Right Side Slope     | 28.80 H : V    |
| Discharge            | 61.00 cfs      |






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\$\$\$FILENAME\$\$\$\$\$  
CADD A1-R3 © STANLEY CONSULTANTS



|                                                                                                                                                                   |  |                                                                 |      |      |           |       |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------|------|------|-----------|-------|--------|
| <div style="text-align: center;"> <br/> <b>Stanley Consultants INC.</b> </div> |  |                                                                 |      |      | SCALE 1:1 |       |        |
| REVISIONS                                                                                                                                                         |  | APVD                                                            | APVD | APVD | DATE      | NO. A | REV. 0 |
| DESIGNED RJM                                                                                                                                                      |  | RHODES HOMES ARIZONA<br>GOLDEN VALLEY RANCH<br>AREA 1 - PHASE B |      |      |           |       |        |
| DRAWN RN                                                                                                                                                          |  |                                                                 |      |      |           |       |        |
| CHECKED                                                                                                                                                           |  |                                                                 |      |      |           |       |        |
| APPROVED                                                                                                                                                          |  |                                                                 |      |      |           |       |        |
| APPROVED                                                                                                                                                          |  | COMMON LOT D<br>NODE J-C25                                      |      |      |           |       |        |
| DATE                                                                                                                                                              |  |                                                                 |      |      |           |       |        |

P O S T E D

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

GOLDEN VALLEY RANCH

HEADING LINE NO 2 IS -

GOLDEN VALLEY

HEADING LINE NO 3 IS -

6 STREET TO GOLF COURSE J-C25 IN POD1 12CFS

ST-RH036399

DATE: 3/14/2006  
TIME: 13:23

F0515P  
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

| CARD | SECT | CHN  | NO OF | AVE PIER | HEIGHT 1 | BASE  | ZL | ZR | INV  | Y(1) | Y(2) | Y(3) | Y(4) | Y(5) | Y(6) | Y(7) | Y(8) | Y(9) | Y(10) |
|------|------|------|-------|----------|----------|-------|----|----|------|------|------|------|------|------|------|------|------|------|-------|
| CODE | NO   | TYPE | PIERS | WIDTH    | DIAMETER | WIDTH |    |    | DROP |      |      |      |      |      |      |      |      |      |       |
| CD   | 30   | 4    |       |          |          | 2.50  |    |    |      |      |      |      |      |      |      |      |      |      |       |

F 0 5 1 5 P

PAGE NO 2

## WATER SURFACE PROFILE - ELEMENT CARD LISTING

|            |   |                       |         |         |      |  |       |  |  |  |  |        |          |          |
|------------|---|-----------------------|---------|---------|------|--|-------|--|--|--|--|--------|----------|----------|
| ELEMENT NO | 1 | IS A SYSTEM OUTLET    | *       | *       | *    |  |       |  |  |  |  |        |          |          |
|            |   | U/S DATA              | STATION | INVERT  | SECT |  |       |  |  |  |  |        | W S ELEV |          |
|            |   |                       | 100.00  | 2479.50 | 30   |  |       |  |  |  |  |        | 2484.20  |          |
| ELEMENT NO | 2 | IS A REACH            | *       | *       | *    |  |       |  |  |  |  |        |          |          |
|            |   | U/S DATA              | STATION | INVERT  | SECT |  | N     |  |  |  |  | RADIUS | ANGLE    | ANG PT   |
|            |   |                       | 420.00  | 2484.56 | 30   |  | 0.013 |  |  |  |  | 0.00   | 0.00     | 0.00     |
|            |   |                       |         |         |      |  |       |  |  |  |  |        |          | MAN H    |
|            |   |                       |         |         |      |  |       |  |  |  |  |        |          | 0        |
| ELEMENT NO | 3 | IS A SYSTEM HEADWORKS | *       | *       | *    |  |       |  |  |  |  |        |          |          |
|            |   | U/S DATA              | STATION | INVERT  | SECT |  |       |  |  |  |  |        |          | W S ELEV |
|            |   |                       | 420.00  | 2484.56 | 30   |  |       |  |  |  |  |        |          | 0.00     |

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

\*\* WARNING NO. 2 \*\* - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

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F0515P

PAGE 1

## WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH  
GOLDEN VALLEY  
6 STREET TO GOLF COURSE J-C25

| STATION        | INVERT<br>ELEV | DEPTH<br>OF FLOW | W.S.<br>ELEV | Q    | VEL  | VEL<br>HEAD | ENERGY<br>GRD-EL. | SUPER<br>ELEV | CRITICAL<br>DEPTH | HGT/<br>DIA | BASE/<br>ID NO. | ZL   | NO<br>PIER | AVEPR |
|----------------|----------------|------------------|--------------|------|------|-------------|-------------------|---------------|-------------------|-------------|-----------------|------|------------|-------|
| L/ELEM         | SO             |                  |              |      |      | SF AVE      | HF                |               | NORM DEPTH        |             |                 | ZR   |            |       |
| 100.00         | 2479.50        | 4.700            | 2484.200     | 12.0 | 2.44 | 0.093       | 2484.293          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 147.10         | 0.01581        |                  |              |      |      | .000848     | 0.12              |               | 0.820             |             |                 | 0.00 |            |       |
| 247.10         | 2481.83        | 2.500            | 2484.326     | 12.0 | 2.44 | 0.093       | 2484.419          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 14.76          | 0.01581        |                  |              |      |      | .000795     | 0.01              |               | 0.820             |             |                 | 0.00 |            |       |
| 261.86         | 2482.06        | 2.268            | 2484.327     | 12.0 | 2.56 | 0.102       | 2484.429          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 8.29           | 0.01581        |                  |              |      |      | .000775     | 0.01              |               | 0.820             |             |                 | 0.00 |            |       |
| 270.15         | 2482.19        | 2.133            | 2484.323     | 12.0 | 2.69 | 0.112       | 2484.435          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 6.67           | 0.01581        |                  |              |      |      | .000839     | 0.01              |               | 0.820             |             |                 | 0.00 |            |       |
| 276.82         | 2482.30        | 2.022            | 2484.318     | 12.0 | 2.82 | 0.124       | 2484.442          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 5.68           | 0.01581        |                  |              |      |      | .000923     | 0.01              |               | 0.820             |             |                 | 0.00 |            |       |
| 282.50         | 2482.39        | 1.925            | 2484.311     | 12.0 | 2.96 | 0.136       | 2484.447          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 5.03           | 0.01581        |                  |              |      |      | .001024     | 0.01              |               | 0.820             |             |                 | 0.00 |            |       |
| 287.53         | 2482.47        | 1.837            | 2484.302     | 12.0 | 3.10 | 0.149       | 2484.451          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 4.44           | 0.01581        |                  |              |      |      | .001143     | 0.01              |               | 0.820             |             |                 | 0.00 |            |       |
| 291.97         | 2482.53        | 1.757            | 2484.292     | 12.0 | 3.25 | 0.164       | 2484.456          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 3.96           | 0.01581        |                  |              |      |      | .001280     | 0.01              |               | 0.820             |             |                 | 0.00 |            |       |
| 295.93         | 2482.60        | 1.683            | 2484.281     | 12.0 | 3.41 | 0.181       | 2484.462          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 3.54           | 0.01581        |                  |              |      |      | .001439     | 0.01              |               | 0.820             |             |                 | 0.00 |            |       |
| 299.47         | 2482.65        | 1.614            | 2484.268     | 12.0 | 3.58 | 0.199       | 2484.467          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 1.14           | 0.01581        |                  |              |      |      | .001551     | 0.00              |               | 0.820             |             |                 | 0.00 |            |       |
| 300.61         | 2482.67        | 1.594            | 2484.266     | 12.0 | 3.63 | 0.205       | 2484.471          | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| HYDRAULIC JUMP |                |                  |              |      |      |             |                   |               |                   |             |                 | 0.00 |            |       |

ST-RH036402

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F0515P

PAGE 2

## WATER SURFACE PROFILE LISTING

GOLDEN VALLEY RANCH  
GOLDEN VALLEY  
6 STREET TO GOLF COURSE J-C25

| STATION | INVERT<br>ELEV | DEPTH<br>OF FLOW | W.S.<br>ELEV | Q    | VEL  | VEL<br>HEAD | ENERGY<br>GRD. EL. | SUPER<br>ELEV | CRITICAL<br>DEPTH | HGT/<br>DIA | BASE/<br>ID NO. | ZL   | NO<br>PIER | AVBPR |
|---------|----------------|------------------|--------------|------|------|-------------|--------------------|---------------|-------------------|-------------|-----------------|------|------------|-------|
| L/ELEM  | SO             |                  |              |      |      | SF AVE      | HF                 |               |                   | NORM DEPTH  |                 |      |            |       |
| 300.61  | 2482.67        | 0.820            | 2483.492     | 12.0 | 8.57 | 1.139       | 2484.631           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 54.32   | 0.01581        |                  |              |      |      | .015065     | 0.82               |               |                   | 0.820       |                 | 0.00 |            |       |
| 354.93  | 2483.53        | 0.842            | 2484.373     | 12.0 | 8.25 | 1.058       | 2485.431           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 27.57   | 0.01581        |                  |              |      |      | .013410     | 0.37               |               |                   | 0.820       |                 | 0.00 |            |       |
| 382.50  | 2483.97        | 0.872            | 2484.839     | 12.0 | 7.87 | 0.961       | 2485.800           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 13.91   | 0.01581        |                  |              |      |      | .011754     | 0.16               |               |                   | 0.820       |                 | 0.00 |            |       |
| 396.41  | 2484.19        | 0.903            | 2485.090     | 12.0 | 7.50 | 0.875       | 2485.965           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 8.63    | 0.01581        |                  |              |      |      | .010304     | 0.09               |               |                   | 0.820       |                 | 0.00 |            |       |
| 405.04  | 2484.32        | 0.935            | 2485.258     | 12.0 | 7.16 | 0.795       | 2486.053           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 5.65    | 0.01581        |                  |              |      |      | .009036     | 0.05               |               |                   | 0.820       |                 | 0.00 |            |       |
| 410.69  | 2484.41        | 0.969            | 2485.382     | 12.0 | 6.82 | 0.723       | 2486.105           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 3.89    | 0.01581        |                  |              |      |      | .007928     | 0.03               |               |                   | 0.820       |                 | 0.00 |            |       |
| 414.58  | 2484.47        | 1.004            | 2485.478     | 12.0 | 6.50 | 0.657       | 2486.135           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 2.57    | 0.01581        |                  |              |      |      | .006960     | 0.02               |               |                   | 0.820       |                 | 0.00 |            |       |
| 417.15  | 2484.51        | 1.041            | 2485.556     | 12.0 | 6.20 | 0.597       | 2486.153           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 1.68    | 0.01581        |                  |              |      |      | .006111     | 0.01               |               |                   | 0.820       |                 | 0.00 |            |       |
| 418.83  | 2484.54        | 1.079            | 2485.621     | 12.0 | 5.91 | 0.543       | 2486.164           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 0.90    | 0.01581        |                  |              |      |      | .005369     | 0.00               |               |                   | 0.820       |                 | 0.00 |            |       |
| 419.73  | 2484.56        | 1.119            | 2485.675     | 12.0 | 5.64 | 0.494       | 2486.169           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |
| 0.27    | 0.01581        |                  |              |      |      | .004712     | 0.00               |               |                   | 0.820       |                 | 0.00 |            |       |
| 420.00  | 2484.56        | 1.162            | 2485.722     | 12.0 | 5.37 | 0.448       | 2486.170           | 0.00          | 1.162             | 2.50        | 0.00            | 0.00 | 0          | 0.00  |

ST-RH036403

GOLDEN VALLEY RANCH  
GOLDEN VALLEY  
6 STREET TO GOLF COURSE J-C25

|         |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |
|---------|---|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|
| 100.00  | . | I | . | C | . | H | . | . | . | WE | . | . | . | . | . | . | R |
| 106.53  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 113.06  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 119.59  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 126.12  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 132.65  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 139.18  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 145.71  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 152.24  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 158.78  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 165.31  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 171.84  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 178.37  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 184.90  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 191.43  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 197.96  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 204.49  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 211.02  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 217.55  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 224.08  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 230.61  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 237.14  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 243.67  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 250.20  | . | . | . | I | . | C | . | . | X | E  | . | . | . | . | . | . | R |
| 256.73  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 263.27  | . | . | . | I | . | C | . | . | W | E  | H | . | . | . | . | . | R |
| 269.80  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 276.33  | . | . | . | I | . | C | . | . | W | E  | H | . | . | . | . | . | R |
| 282.86  | . | . | . | I | . | C | . | . | W | E  | . | H | . | . | . | . | R |
| 289.39  | . | . | . | I | . | C | . | . | W | E  | . | H | . | . | . | . | R |
| 295.92  | . | . | . | I | . | C | . | . | W | E  | . | H | . | . | . | . | R |
| 302.45  | . | . | . | I | . | C | . | . | W | E  | . | H | . | . | . | . | R |
| 308.98  | . | . | . | I | . | C | . | . | W | E  | . | H | . | . | . | . | R |
| 315.51  | . | . | . | I | . | C | . | . | W | E  | . | H | . | . | . | . | R |
| 322.04  | . | . | . | I | . | C | . | . | W | E  | . | H | . | . | . | . | R |
| 328.57  | . | . | . | I | . | W | C | . | E | .  | . | H | . | . | . | . | R |
| 335.10  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 341.63  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 348.16  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 354.69  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 361.22  | . | . | . | . | . | I | . | . | W | C  | . | E | . | H | . | . | R |
| 367.76  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 374.29  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 380.82  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 387.35  | . | . | . | . | . | . | . | I | . | W  | C | . | E | . | H | . | R |
| 393.88  | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 400.41  | . | . | . | . | . | . | . | . | I | .  | W | C | . | E | . | H | R |
| 406.94  | . | . | . | . | . | . | . | . | I | .  | W | C | . | E | . | H | R |
| 413.47  | . | . | . | . | . | . | . | . | I | .  | W | C | . | E | . | H | R |
| 420.00  | . | . | . | . | . | . | . | . | I | .  | W | C | . | E | . | H | R |
| 2479.50 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2480.26 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2481.01 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2481.77 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2482.52 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2483.28 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2484.04 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2484.79 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2485.55 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2486.30 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |
| 2487.06 | . | . | . | . | . | . | . | . | . | .  | . | . | . | . | . | . | . |

NOTES

1. GLOSSARY

- I = INVERT ELEVATION
- C = CRITICAL DEPTH
- W = WATER SURFACE ELEVATION
- H = HEIGHT OF CHANNEL
- E = ENERGY GRADE LINE
- X = CURVES CROSSING OVER
- B = BRIDGE ENTRANCE OR EXIT
- Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY



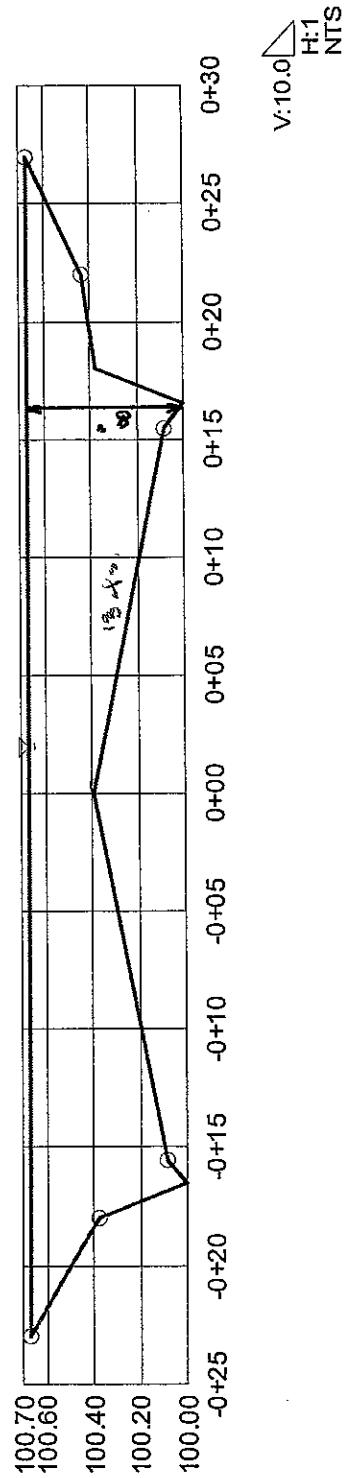
**GOLDEN VALLEY RANCH**

# **APPENDIX C**

## **STREET CAPACITY (LOCAL STREETS)**

# Cross Section Cross Section for Irregular Channel

| Project Description  |                  |
|----------------------|------------------|
| Worksheet            | Local Str 50' Pl |
| Flow Element         | Irregular Chani  |
| Method               | Manning's Forr   |
| Solve For            | Discharge        |
| Section Data         |                  |
| Mannings Coefficient | 0.014            |
| Channel Slope        | 0.005000 ft/ft   |
| Water Surface Elev.  | 100.67 ft        |
| Elevation Range      | 0.00 to 100.67   |
| Discharge            | 68.88 cfs        |



q:\18449\drainage calcs\street flow.fm2  
12/30/05 11:35:56 AM

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Project Engineer: Information Services  
FlowMaster v7.0 [7.0005]  
Page 1 of 1

## Table

## Rating Table for Irregular Channel

| Project Description |                 |
|---------------------|-----------------|
| Worksheet           | Local Str 50'PL |
| Flow Element        | Irregular Chan  |
| Method              | Manning's For   |
| Solve For           | Discharge       |

| Input Data                   |
|------------------------------|
| Water Surface Elev. 00.67 ft |

| Options                                        |
|------------------------------------------------|
| Current Roughness Method: over Lotter's Method |
| Open Channel Weighting: over Lotter's Method   |
| Closed Channel Weighting: Horton's Method      |

| Attribute             | Minimum  | Maximum  | Increment |
|-----------------------|----------|----------|-----------|
| Channel Slope (ft/ft) | 0.005000 | 0.020000 | 0.000100  |

| Channel Slope (ft/ft) | Discharge (cfs) | Velocity (ft/s) | Flow Area (ft²) | Wetted Perimeter (ft) | Top Width (ft) |
|-----------------------|-----------------|-----------------|-----------------|-----------------------|----------------|
| 0.005000              | 68.88           | 3.73            | 18.5            | 50.12                 | 50.00          |
| 0.005100              | 69.57           | 3.76            | 18.5            | 50.12                 | 50.00          |
| 0.005200              | 70.25           | 3.80            | 18.5            | 50.12                 | 50.00          |
| 0.005300              | 70.92           | 3.84            | 18.5            | 50.12                 | 50.00          |
| 0.005400              | 71.59           | 3.87            | 18.5            | 50.12                 | 50.00          |
| 0.005500              | 72.25           | 3.91            | 18.5            | 50.12                 | 50.00          |
| 0.005600              | 72.90           | 3.94            | 18.5            | 50.12                 | 50.00          |
| 0.005700              | 73.55           | 3.98            | 18.5            | 50.12                 | 50.00          |
| 0.005800              | 74.19           | 4.01            | 18.5            | 50.12                 | 50.00          |
| 0.005900              | 74.83           | 4.05            | 18.5            | 50.12                 | 50.00          |
| 0.006000              | 75.46           | 4.08            | 18.5            | 50.12                 | 50.00          |
| 0.006100              | 76.09           | 4.12            | 18.5            | 50.12                 | 50.00          |
| 0.006200              | 76.71           | 4.15            | 18.5            | 50.12                 | 50.00          |
| 0.006300              | 77.32           | 4.18            | 18.5            | 50.12                 | 50.00          |
| 0.006400              | 77.93           | 4.22            | 18.5            | 50.12                 | 50.00          |
| 0.006500              | 78.54           | 4.25            | 18.5            | 50.12                 | 50.00          |
| 0.006600              | 79.14           | 4.28            | 18.5            | 50.12                 | 50.00          |
| 0.006700              | 79.74           | 4.31            | 18.5            | 50.12                 | 50.00          |
| 0.006800              | 80.33           | 4.35            | 18.5            | 50.12                 | 50.00          |
| 0.006900              | 80.92           | 4.38            | 18.5            | 50.12                 | 50.00          |
| 0.007000              | 81.51           | 4.41            | 18.5            | 50.12                 | 50.00          |
| 0.007100              | 82.09           | 4.44            | 18.5            | 50.12                 | 50.00          |
| 0.007200              | 82.66           | 4.47            | 18.5            | 50.12                 | 50.00          |
| 0.007300              | 83.23           | 4.50            | 18.5            | 50.12                 | 50.00          |
| 0.007400              | 83.80           | 4.53            | 18.5            | 50.12                 | 50.00          |
| 0.007500              | 84.37           | 4.56            | 18.5            | 50.12                 | 50.00          |
| 0.007600              | 84.93           | 4.60            | 18.5            | 50.12                 | 50.00          |
| 0.007700              | 85.48           | 4.63            | 18.5            | 50.12                 | 50.00          |
| 0.007800              | 86.04           | 4.66            | 18.5            | 50.12                 | 50.00          |
| 0.007900              | 86.59           | 4.69            | 18.5            | 50.12                 | 50.00          |
| 0.008000              | 87.13           | 4.71            | 18.5            | 50.12                 | 50.00          |
| 0.008100              | 87.68           | 4.74            | 18.5            | 50.12                 | 50.00          |
| 0.008200              | 88.22           | 4.77            | 18.5            | 50.12                 | 50.00          |
| 0.008300              | 88.75           | 4.80            | 18.5            | 50.12                 | 50.00          |

Project Engineer: Information Services

FlowMaster v7.0 [7.0005]

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